STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

Commonwealth Edison Company	**:**	
	:	**17-0331**
Petition Concerning the Implementation of	**:**	
A Demonstration Distribution Microgrid	**:**	

ORDER

February 28, 2018

TABLE OF CONTENTS

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By the Commission:

I. PROCEDURAL HISTORY

On July 28, 2017, Commonwealth Edison Company ("ComEd" or the "Company") filed with the Illinois Commerce Commission ("Commission") a Verified Petition ("Petition") requesting the Commission, under Section 10-101 of the Illinois Public Utilities Act ("PUA" or the "Act"), and by its authority under Articles V, VIII, IX, and XVI of the PUA, issue an order making certain rate-related findings regarding its proposed distribution microgrid demonstration project and study (the "Bronzeville Microgrid Demonstration Project" or the "Project"). More specifically, the Petition requests that the Commission: (a) find that the Project is prudent and reasonable; (b) find that it supports ComEd's provision of delivery services; (c) approve the proposed accounting and rate treatment; and (d) confirm that the Project will not impair the rights of customers to select their energy supplier. The Petition also states that the Project is to be built in the Bronzeville area of the City of Chicago with the support of United States Department of Energy ("DOE") grants and will provide important experience and learnings regarding the value and use of microgrids, and the use of distributed energy resources ("DER") in a distribution function to support microgrid operations, and that the experience and learnings gained from the Project will benefit customers and the public generally by advancing distribution grid design and operation.

Appearances or petitions to intervene were filed by ComEd, Staff of the Commission ("Staff"), the Illinois Attorney General's Office ("AG"), the Citizens Utility Board ("CUB") and Environmental Defense Fund ("EDF") (together, "CUB/EDF"), Direct Energy Services and Direct Energy Business (together, "Direct"), the Environmental Law and Policy Center ("ELPC") and Vote Solar (together, "ELPC/Vote"), and the Illinois Competitive Energy Association ("ICEA"). All of the aforementioned participated in this docket.

On August 14, 2017, GlidePath Development LLC ("GlidePath") filed its Verified Petition to Intervene in this matter to which ComEd objected on August 18, 2017, and the Administrative Law Judge ("ALJ") ultimately denied on September 15, 2017. GlidePath also filed an Amended Petition to Intervene which was denied as well on November 7,

2017. GlidePath's Petition for Interlocutory Appeal was denied by the Commission on December 13, 2017, as was its Petition to Reconsider Petition for Interlocutory Appeal on January 10, 2018.

Pursuant to due notice, an evidentiary hearing was held in this docket at the Commission's Chicago Office on November 30, 2017 and December 1, 2017. The following ComEd witnesses testified in this case: J oseph Svachula; Shay Bahramirad, Ph.D.[1]; Ralph Masiello, Ph.D.; Scott Vogt; Chad A. Newhouse, CPA; Michael G. Masters; Hon. Susan F. Tierney, Ph. D.; and Steven T. Naumann, P.E. Staff's witnesses included: David Rearden; Greg Rockrohr; and Bonita A. Pearce. The AG sponsored the testimony of Lee L. Selwyn, Ph. D., CUB/EDF sponsored the testimony of Andrew Barbeau, Direct sponsored the testimony of Thomas Hawes, ELPC/Vote sponsored the testimony of Dean Moretton. ICEA sponsored the testimony of Kevin Wright. The ALJ marked the matter "Heard and Taken" at the conclusion of the evidentiary hearing on December 1, 2017.

ComEd, Staff, the AG, CUB/EDF, ELPC/Vote, ICEA, and Direct filed and served Initial Briefs on December 19, 2017. Reply Briefs were filed and served on December 27, 2017, and December 28, 2017, by the aforementioned parties. On January 24, 2018, a Proposed Order was served on the parties. On February 7, 2018, Staff, Direct, ICEA, ELPC/Vote, and the AG filed Briefs on Exceptions. On February 14, 2018, CUB/EDF, ELPC/Vote, the AG, and ComEd filed Reply Briefs on Exceptions.

II. COMED'S PROPOSED PROJECT

A. Scope of the Project

ComEd explains that the Project is a single, carefully designed demonstration of a community microgrid. As a pilot demonstration project, it is expected to provide direct benefits to the customers within its footprint and surrounding areas and to deliver important practical experience and learnings. ComEd's witnesses testified that a primary purpose of, and justification for, the Project is to generate real world planning and operational experience with, and a range of learnings about, cutting-edge microgrid technologies, the interconnection of microgrids with DER, the clustering of utility and private microgrids, and the planning and operation of a clustered and/or community microgrid. ComEd states that the Project's scope, design, and characteristics were chosen to provide the required benefits, information, and experience. ComEd also states that the Project will benefit the Commission, customers, DER and other service providers, system operators, and the public.

ComEd intends to study the project over a period of ten years and report the learnings over that timeframe. ComEd developed a comprehensive set of metrics that are designed to enable detailed analysis of the impacts, benefits, and costs of the Project. ComEd states that it will evaluate the significance of the information gleaned by metrics it has developed to determine the extent to which the individual metrics provide actionable

[1] Dr. Bahramirad also adopted the pre-filed written testimony of Manuel Avendano, Ph.D.

information, and may adjust the metrics over the life of the Project, or when implementing future similar projects, to better understand the impacts.

Specifically, ComEd expects to use the metrics to learn about the value of microgrids, grid security and reliability, best practices for siting microgrids, best practices in integrating DER into the grid, microgrid operation and coordination among microgrids, emerging technologies and standards, third-party non-storage DER ownership, clustering of microgrids, and the impact of increased resiliency on economic development. ComEd contends that the learnings available from the Project can be applied both inside and outside microgrids, and that the Project will thus generate information that ComEd can apply to improve future distribution system design and operation across its entire service territory.

ComEd explains that the DOE is supporting the Project with two grants: first, a $1.2 million grant to research, develop, and test an advanced microgrid controller that is capable of controlling the Project and integrating it with the existing Illinois Institute of Technology ("IIT") microgrid nearby; and second, a grant of approximately $4 million from the DOE's Sustainable and Holistic Integration of Energy Storage and Solar PV ("SHINES") program to design and deploy solar and battery storage technology in a microgrid. ComEd explains that the DOE SHINES program grant requires a matching cost share of $4 million from ComEd and its partners, which include leading research universities, national laboratories, and technology providers. ComEd notes that the objectives associated with the DOE grants align with the learnings ComEd expects from the Project, and include reducing the total time of interruption of service at a cost comparable to traditional options such as an uninterruptable power supply with a backup generator, reducing aggregate emissions by enabling greater penetration of renewable DER, more efficient use of energy supply resources, and reducing delivery system losses and inefficiencies.

ComEd states that its proposed configuration for the Project will serve approximately 1,060 residential, commercial, and small industrial customers with an aggregate load of approximately 7 megawatts ("MW") in the Bronzeville neighborhood in Chicago. ComEd notes the Project will include the following critical public service customers: the De La Salle Institute; the Perspectives/IIT Math & Science Academy; the Chicago Bee Public Library; Kensington Place Nursing and Rehabilitation Center; Illinois College of Optometry; Symphony of Bronzeville Skilled Nursing and Living Center; Chicago Military Academy at Bronzeville; Heartland Human Care Services; and the Public Safety Headquarters of the City of Chicago, which includes the full City of Chicago Police Department ("CPD") headquarters. ComEd explains more specifically that the proposed Phase I and Phase II of the Project together would cover 0.29 square miles and serve 1,060 customers. Phase I covers the four city blocks between 34th Street and 38th Street and the six city blocks between Giles Street and the east side State Street in Chicago, serving 490 customers. Phase II would expand the microgrid two blocks to the east from Giles to the west side of Martin Luther King Jr. Drive, and one block north to 33rd Street and bring the total number of customers in the microgrid area to 1,060.

ComEd states that the Bronzeville location is optimal for a demonstration and study of a clustered microgrid based on a combination of factors that were objectively evaluated and ranked in the comprehensive study it performed to determine where the Project

should be located. ComEd states that it developed a site-selection analysis tool to identify locations which would most benefit from the added resiliency provided by a microgrid. ComEd divided its service territory into thousands of geographic sections and assigned an overall resiliency score to each section. This score weighted key factors, including existing power delivery infrastructure, critical customer population, and external input from stakeholders in order to understand which areas would benefit most from a microgrid. Of the six possible locations identified through this process, ComEd selected the Bronzeville site because its position adjacent to the existing IIT microgrid allows industry-leading clustering between microgrids to coordinate load and resources.

ComEd explains that the footprint of the Project was chosen to include the required network complexity and diversity in load and customer types that will allow ComEd to evaluate the ability of a microgrid to meet power quality and reliability needs of various customer classes, and study a broad range of DER, diverse power flows and power management requirements, and dynamic control of voltage and reactive power. In addition, ComEd states the Project footprint is large and diverse enough to support economically viable bidding by third-parties for installation of Project non-storage DER.

ComEd states the Project is a full-size, utility-scale microgrid, which is necessary to allow modelling of the sizes and types of microgrid most likely to be deployed in the future. ComEd maintains that the Project will incorporate a full feeder which is a fundamental building block of the distribution system. Incorporating a full feeder is crucial to understanding how a microgrid functions when it controls a full feeder directly interconnected at the supply substation. ComEd submits that incorporating a full feeder within the Project allows ComEd to sectionalize and create multiple configurations, which can be compared against each other to gain operational and design learnings for optimal microgrid design under a variety of operating scenarios.

As alluded to above, ComEd plans for construction of the Project to proceed in two phases in order to allow the Company to meet the requirements of the DOE SHINES grant before the entire Project is completed. Phase I focuses on the SHINES grant requirements and includes 2.5 MW of load, requires reconfiguration of one existing feeder along with associated cable reconnections and a 12 kilovolt circuit extension to enable microgrid configuration, and installation of at least 0.75 MW of solar photovoltaic ("PV") and 0.5 MW / 2 MW hours ("MWh") of battery storage. ComEd may also employ 3 MW of mobile diesel generators, which it already owns and uses for emergency purposes, for testing in this phase. ComEd indicates that the estimated total cost of the Project in Phase I (net of the $4 million DOE grant and $600,000 from Project partners) is approximately $8 million. ComEd states that the objective of the SHINES grant is to demonstrate the benefits of batteries in more efficiently incorporating solar PV in a microgrid. Phase I is to be completed by January, 2019.

In Phase II of the Project, ComEd will add 4.5 MW of load along with approximately 7 MW of controllable generation resources. ComEd also plans to interconnect with the existing microgrid at IIT in this phase to achieve clustering. ComEd estimates the cost of Phase II will be approximately $17 million depending on the mix of DER incorporated and the outcome of the competitive procurement process the Company plans to conduct. ComEd asserts that once this phase is completed, the Phase II integrated DER will

provide enough power to maintain service within the microgrid when it is islanded from the larger ComEd grid.

B. Description / Operation of the Equipment

ComEd states that the Project configuration will enable study of a fully functional microgrid that can withstand, respond to, and recover rapidly from disruptions caused by major outages in the larger electric grid. According to ComEd, the Project's 7 MW of controllable non-mobile DER will enable the project to meet 100% of the maximum peak load within the Project area, so that, when the Project is operating in island mode, all delivery customers in the Bronzeville area will continue to be served. In addition, ComEd states the Project will interconnect with the IIT microgrid to enable clustering. ComEd argues the interconnection with IIT provides a unique opportunity to develop learnings regarding how two clustered microgrids can coordinate load and resources to serve a variety of customers and critical facilities.

ComEd states that the Project includes reconfiguration of existing infrastructure to enable the Project to island itself and operate separately from the larger grid. ComEd explains that this work will involve installation of distribution automation ("DA") and Phasor Measurement Unit ("PMU") devices, and extensive reconfiguration of the system, including upgraded or upsized distribution circuits and switches. ComEd explains that these devices, which utilize high-speed fiber communication technologies, provide precise and highly-detailed data that will enable ComEd to identify fault locations, model load, and precisely measure the Project's performance according to the metrics. ComEd states that the highly-detailed data PMU devices provide is necessary to support robust state estimation and measurement on a microgrid, in the absence of the massive inertia and long time constraints present on the larger grid, as well as to enable other essential analysis and pattern recognition.

ComEd states that the Project systems will be managed by the Microgrid Master Controller ("MMC"), which will integrate supply, distribution, and consumption of electricity in the area, and is capable of forecasting and coordinating solar PV output and load with the associated on-site non-PV DER and battery storage systems. The MMC is also at the center of the clustering with IIT's microgrid and will therefore enable the microgrids to function together as the first cluster of utility and third-party-owned microgrids.

ComEd explains that the timeline for the Project has been divided into two phases in light of requirements of DOE grants. ComEd states Phase I will consist of completion of the requirements of the DOE SHINES grant, which focuses on integrating smart inverter technology, solar PV, and battery storage in microgrid operation with at least 0.75 MW of solar PV and 0.5 MW/2MWh of battery storage. At the completion of Phase I, ComEd explains, the Project will not be a stand-alone microgrid or serve the entirety of the headquarters of the CPD.

III. PROCUREMENT OF PROJECT DER

A. ComEd's Position

ComEd states that the Project DER will include 0.5MW/2MWh of battery energy storage, 0.75 MW of solar PV, and approximately 7 MW of additional permanent DER. While ComEd must own the battery energy storage, which will solely function as part of the distribution grid, ComEd explains that it will not own the remainder of Project DER. ComEd proposes to acquire the necessary rights to utilize non-storage DER from private, third-party owners, in a competitive procurement process either by contract, in which case the remaining rights to the DER will remain with the owners, or through a lease.

ComEd states that in response to concerns over the ownership and procurement of non-storage DER equipment, ComEd expressly adapted its proposal to make clear that it will seek to acquire rights to utilize privately-owned non-storage DER for Project purposes through a competitive procurement process. Even if no qualified bids are received in that process, or there is no reasonably priced option, ComEd will still seek to lease that non-storage DER equipment from third-party owners and will file with the Commission a report specifically describing the results of the procurement. ComEd states that it plans to procure these distribution services provided by third-party-owned non-storage DER for as long as ComEd retains the ability to control those resources, and commits to making the request for proposal ("RFP") clear that the arrangement will last as long as the demonstration is in effect and longer if ComEd continues to assert control over the non-storage DER after the demonstration has ended.

ComEd states further that it is committed to engage in a collaborative process with non-vendor stakeholders to discuss terms of the procurement process for third-party-owned non-storage DER generating equipment and to follow the procurement process discussed and revised by ComEd through that collaboration. ComEd proposes the following procedures for these workshops:

- Commission guidance, in the Order in this docket, regarding the balance between emphasis on renewable non-storage DER and cost;
- Vendors, consultants, or representatives who could gain an unfair advantage from proprietary commercial and operational/design information should be excluded from the workshops;
- Participants should be required to sign confidentiality agreements, and any discussion materials shall be numbered and collected after each workshop;
- All bid information will be kept anonymous (*e.g.*, Bidder A, B, C) with disclosure of workshop process in RFP;
- ComEd will report to participants on the results of the bid ranking; and
- ComEd will bear ultimate responsibility for decisions to ensure the safe operation of the microgrid, and should therefore have final say over RFP terms and conditions.

ComEd explains that it intends to conduct separate procurement workshops: one series of workshops prior to Phase I of the Project and a second series of workshops before the commencement of Phase II. ComEd proposes that the first workshop series should begin promptly after the Order is issued, and explains the second is expected to take place in the fourth quarter of 2018 or the first quarter of 2019. ComEd states each workshop series will consist of four workshops: in Workshop #1, ComEd will provide and discuss its draft RFP and give participants an opportunity to comment on the draft RFP; in Workshop #2, ComEd will address stakeholder comments and issue the RFP; in Workshop #3, ComEd will conduct an initial review and screening of bids with the workshop participants; and at Workshop #4, ComEd will anonymously identify bidders who made the final cut, with whom ComEd will enter final negotiations. When workshops are complete, ComEd will announce the winning bidder(s).

ComEd proposes that the selection criteria for procurement include: (1) capability and reliability; (2) capital cost; (3) environmental attributes; (4) operating cost; (5) operational performance history; (6) experience of the vendor with similar DER; (7) experience of the vendor in Illinois and the City of Chicago; (8) financial stability of the vendor; (9) ability of the vendor to meet target schedules; (10) safety; (11) engineering standards and requirements; and (12) commitment and support of diversity principles and diverse suppliers to the extent allowed by law.

If no bids are received, or the bids received are so expensive as to affect the overall cost structure of the Project, ComEd states it will lease the non-storage DER equipment instead.

ComEd explains the competitive procurement process will provide stakeholders with valuable learnings regarding prices for non-storage DER in the competitive market. ComEd states that, because it will procure only the portion of output that supports distribution purposes, the procurement process will help ComEd and stakeholders understand the grid reliability and resiliency roles non-storage DER can play in a microgrid.

ComEd notes that ICEA agrees with ComEd's proposal except that it prefers that the filed report also cover the following circumstances where no bid is successful: 1) no responsive bids are submitted in response to the RFP; 2) responsive bids are received, but none of those bids are reasonable; or 3) bids are received but are so expensive that the costs would affect the overall cost structure of the Project or accepting them would raise questions of prudence. ICEA stated that the better approach is proposed by ICEA witness Mr. Wright, where the Commission reviews the evidence – on an expedited basis, without opening a docket – to approve ComEd's conclusion on any one of the criteria set out by ComEd's testimony. Then, after the Commission approves ComEd's conclusion, ComEd could execute its contingency plan (i.e. enter into a lease).

In the interest of resolving remaining open issues, ComEd now further agrees to file a special report in the event that ComEd does not receive any qualified bid (or otherwise abandons the results of the procurement process for any reason) with the qualification that the Commission need not act in order for the Project to continue. ComEd states this is an important distinction that should be made to make clear that no litigated process is necessary to move forward – unless the Commission decides to open a docket

through an initiating order. If this were not the case, ComEd explains, the filing of the report proposed by ICEA could itself invite months of delay and complication whether a docket is opened or not. Further, contrary to ICEA's assumption stated above, under ComEd's proposal, the Commission would review the report – but there would be no review of "evidence" unless the Commission opened a formal docket to take evidence.

ComEd states that these modifications to ICEA's proposal are relatively minor but, without the additional clarification, there could be confusion that could lead to delays in the Project. For example, if the Commission's Order is not clear that the investment will continue unless the Commission orders otherwise – the lack of clarity could lead to time wasted in order for parties to seek clarifying orders. ComEd maintains the Commission's Order in this docket should send a clear message that the project is moving forward without being contingent on any additional process or litigation.

ComEd asks the Commission to reject ICEA's recommendation that the Commission exercise its discretion and direct ComEd to competitively bid storage assets for the pilot Project. ComEd notes that Direct makes a similar recommendation, although it did not submit any evidence on this issue. ComEd states ICEA's recommendation is made without undertaking any engineering analysis of the operation of the storage equipment in this microgrid. ComEd notes ICEA does not condition its support of the Project on third-party ownership of storage as long as the ComEd owned storage is solely used for distribution (such as reliability) purposes, and ICEA acknowledges that there are no legal barriers to ComEd owning and operating storage.

ComEd explains that it is not operationally practical for third-party owned storage to function as the type of integrated distribution device required and imposing a requirement that ComEd use third-party storage in this manner would also be contrary to DOE grant requirements. ComEd also notes that ICEA has not explained how ComEd's ownership of storage could change the analysis of the prudence of the Project, and that there is no evidence to support the conclusion that third-party ownership of storage will be anything other than a barrier to the operation of the microgrid.

ComEd maintains that ICEA and Direct's recommendation should be rejected. ComEd states that the evidence shows that, for the distribution purposes here at issue, storage cannot be practically procured in the same way as non-storage DER generating equipment because ComEd will need to exercise full control over the storage devices within the timeline of the DOE grant and for the duration of the Project. ComEd points to ComEd witness Svachula's testimony that ComEd would need access to the monitoring and control functions of the storage device, including an open protocol with communications access to allow it to test and implement new inverter control algorithms being developed in the SHINES project and to accomplish the critical distribution function to maintain the necessary reliability and resilience of the microgrid area. Thus, ComEd asserts it must own the battery energy storage in order to properly control and operate those assets. Given that the testing and operation of storage is such an integral part of the DOE study, ComEd states it would not make sense to have third-parties own or operate this component of the Project.

ComEd also notes two remaining issues raised by Direct, characterized as procedural fairness safeguards that would improve bidder perception. First, Direct wants

ComEd to issue a request for information ("RFI")/request for quote ("RFQ") before the RFP; and, second, Direct wants ComEd to publish in advance a price over which ComEd will abandon the results of the competitive procurement.

ComEd asserts that requiring ComEd to issue an RFI/RFQ is not warranted, would cause undue delay in the procurement process, would have the effect of keeping qualified bidders from participating in the RFP, and impose unnecessary delay on the implementation of Phase I. ComEd explains that, if the Commission approves the Project as proposed, the procurement collaborative will begin very soon after the Commission enters its final order. ComEd states there simply is no time for this additional procurement step with respect to Phase I. Moreover, it is not clear what would be accomplished through the RFI/RFQ, as parties are not limited from bidding on the Project non-storage DER. ComEd is concerned that the input from seasoned individuals or companies and potential Project bidders regarding the qualifications for bidding could have the effect of keeping qualified bidders from participating in the RFP. Nonetheless, ComEd states it would be open to discussing this issue in the Phase II procurement collaborative – but there is no time to address this for the Phase I procurement.

ComEd asserts Direct's second request, that ComEd publish in advance a maximum bid price, is contrary to the public interest. While Direct expresses concern that ComEd could abandon the procurement process under a subjective standard, ComEd states there is no evidence at all that ComEd could – or would have any reason to – arbitrarily abandon the procurement process, especially given the requirement to report the results to the Commission. Moreover, while Direct states that not publishing a maximum price in advance introduces uncertainty for bidders, ComEd explains that publishing maximum prices is not the norm. ComEd maintains such disclosures would affect the integrity of the process and, thus, would not be fair to customers. One can only imagine that in a situation where the ceiling is higher than what bidders would guess or calculate, bidder knowledge of that higher ceiling would have the effect of bidders submitting higher bids. And, while Direct asserts there would be little to no opportunity for gaming, because ComEd's maximum will be a maximum and bidders who try to exceed the maximum will find their bids rejected, ComEd contends Direct misses the point. ComEd explains the concern is not that announcing a maximum will cause bidders to exceed it, but that bidders will all strive to get as close as possible to the maximum without exceeding it. ComEd states the goal of the process is to get a market price, not to set de facto ceilings on bidding. Therefore, ComEd asserts it would not be in the public interest to give potential bidders information that could lead to higher bids.

ComEd also asks that the Commission reject the AG's claim that the Commission should not make any conclusions about the prudence, reasonableness, or viability of Phase I or Phase II of the microgrid project until the cost and other terms governing the procurement of project energy resources are established. ComEd asserts that the AG's argument is baseless, as the AG appears to misunderstand that the RFP will set forth parameters for non-storage DER procurement, and that one of the key Project learnings – whether there is a market for distribution portion of the non-storage DER value stack – will come from the procurement process. ComEd explains there is value in better understanding the market for third-party non-storage DER and what compensation would be required in exchange for the right to utilize non-storage DER output for distribution grid

reliability and resiliency purposes. Moreover, ComEd states that while the detailed results of the procurement cannot be known at this time, the prudence of proceeding with the Project (understanding that the prudence of any particular expense will be addressed in a future rate case) can and should be judged based on the conservative "high end" budgets ComEd has presented, which include the cost of DER. ComEd states the prudence standard is grounded in the actions of a "reasonable" utility executive, and all business executives can and do take action in the face of uncertainty based on reliable projections.

B. AG's Position

The AG notes the uncertainty associated with the procurement of DER, and asks the Commission not to make any conclusions about the prudence, reasonableness or viability of Phase I or Phase II of the Project until the cost and other terms governing the procurement of project energy resources are established. The AG points out that although the solar resources for Phase I are to be in place by January 1, 2019, ComEd does not have a plan for procuring or integrating the required solar generation, and has not determined if it will begin construction if the microgrid generation is not yet in place. ComEd identified only one existing solar PV installation in the microgrid area, with a capacity of 0.38 kilowatts ("kW"). The AG is concerned about whether it is feasible to obtain 750 kW of solar PV from rooftop solar, given that more than 60 residential locations or 16 commercial locations would be needed assuming the average capacity is comparable to ComEd's system average of 6 and 47 kW for residential and commercial systems, respectively.

The AG states that ComEd already has portable diesel generation that it uses when necessary to support its distribution of energy in the event of an outage. While ComEd did not include the cost of utilizing mobile generation for grid resilience, the Commission should consider whether the public safety interests ComEd associates with the Project can be addressed more economically by targeted use of mobile generation, rather than by building 4.5 MW of generation that will only be necessary in the unlikely event of interruption of two substations, two feeders, and the failure of existing distribution automation and modernization equipment.

C. Staff's Position

Staff notes that ComEd initially proposed that it would either acquire the rights to use the DER included in its microgrid or lease the equipment from a third party. ComEd Ex. 1.0 at 22. In the event those options were not available at prudent cost, the Company proposed to own the DER outright. ComEd Ex. 1 at 27-28. After considering Staff's and the intervenors' objections to owning the generation assets, ComEd has pledged to not own the generation and only lease the assets if an economic option to use third party DER is not available. ComEd Ex. 7.0 at 9. Staff has no objection to the Company's approach.

Staff supports the procurement workshop process proposed by ComEd, recognizing the value of collaboration amongst the Company and non-vendor stakeholders to discuss and inform the procurement process for third-party owned DER generation equipment.

D. ICEA's Position

ICEA makes two recommendations with regard to ComEd's procurement of Project DER. First, ICEA recommends that in the event ComEd seeks to abandon the results of the competitive procurement for Project DER, that the Commission review and approve ComEd's determination in an expedited fashion (without a docketed proceeding). ICEA conditions its support for ComEd's Petition on the Commission accepting ICEA's recommendation for the inclusion of its proposed review process. Second, ICEA recommends that the Commission direct ComEd to competitively bid storage using a similar "distribution capacity" model that ComEd proposes for generation DER.

As an initial matter, ICEA directs the Commission's attention to the commitments and compromises made by ComEd—movement that ICEA notes allowed it to significantly narrow its issues with ComEd's proposal. First and foremost among those commitments, states ICEA, is ComEd's commitment to not own generation and instead procure a "distribution capacity" product from third party owners and operators, and if that competitive procurement fails then to lease from a third party owner/operator. ICEA also identifies ComEd's commitment to a detailed schedule of workshops to inform the competitive procurement of generation for the microgrid as a positive commitment.

ICEA states that it has raised these commitments for two reasons. First, ICEA believes that ComEd should be recognized for its significant movement on these issues. Second, ICEA urges the Commission to memorialize these commitments in its Final Order. While ICEA states it has no reason to believe or expect that ComEd would not live up to its commitments, ICEA believes that memorializing them in the Final Order will help keep a clear record of the Project's design in the event that ComEd or any other utility requests approval for microgrids in the future.

ICEA notes that ComEd also proposes that it should be allowed to abandon the results (i.e. not sign a contract with one or more bidders) of the competitive procurement for microgrid generation DER for at least three reasons: 1) there are no responsive bids submitted in response to the RFP; 2) there are responsive bids to the RFP but none are reasonable; and 3) bids received are so expensive that the costs would affect the overall cost structure of the Project or ComEd believes that accepting them would raise questions of prudence. ICEA avers that it did not disagree with ComEd's proposed bases for abandoning the competitive RFP and reverting to ComEd's proposed alternative of a lease or capital lease. ICEA notes that its witness, Kevin Wright, testified that "having a contingency plan is not only understandable, but also prudent."

While ICEA states that ComEd, ICEA, and most (if not all) other parties appear to agree to that point, ICEA goes further with its proposal for the inclusion of a mechanism that would allow for limited Commission oversight over the procurement, which ICEA states would trigger only in the event that ComEd abandons the results of the competitive procurement process. ICEA recommends that the Commission's review would be limited to evaluating ComEd's conclusion that one or more of the criteria set out by Mr. Svachula for abandoning the results were in fact met. ICEA witness Mr. Wright outlined the proposal as follows:

> I recommend that the Commission review the evidence and assess the appropriateness of ComEd's finding before any

> contingency plan is triggered. As a former Chairman and Commissioner, I strongly believe in the value of Commission oversight. If the Commission is to review, however, the review should be expedited (especially in Phase I so as not to endanger federal grants). I also note that if the Commission undertook a review like it does over Illinois Power Agency procurement events, there would not necessarily be a docketed proceeding. While I am advised by counsel that the Illinois Power Agency review is specifically authorized by statute and may not be directly applicable, I am using it to illustrate that I am envisioning a quick Commission response.

ICEA Ex. 2.0 at 11-12. ICEA avers that the "contingency plan" referenced means ComEd's recommendation (to which ICEA did not object) that ComEd enter into a lease for DER owned and operated by a third party. ICEA argues that its proposal is designed to balance the interests of ComEd in expeditious resolution—in particular in Phase I where time is of the essence for ComEd's federal grant—and the interests of bidders (and ratepayers) in a competitive, fair process to procure competitively bid DER.

ICEA notes that instead of an immediate Commission review and approval process, ComEd proposes to file with the Commission a report describing the procurement results if ComEd seeks to abandon the competitive procurement results for any reason. ICEA states that it appreciates that ComEd would provide public (and, presumably to appropriate non-bidding parties, confidential) information in a proposed special report that the Commission could act on if it so chose. ICEA offers that ComEd's new proposal addresses ICEA's concern that ComEd's previous proposal would only provide for additional reporting under one of several potential scenarios for ComEd abandoning competitive procurement results. However, ICEA states that it continues to believe that the better approach is proposed by Mr. Wright, where the Commission reviews the evidence—on an expedited basis, without opening a docket, in a timeframe of a few days—to approve ComEd's conclusion on any one of the criteria for abandonment set out by ComEd's testimony. Then, after the Commission approves ComEd's conclusion, ICEA concludes, ComEd could execute its contingency plan (i.e. enter into a lease).

In addition to Commission oversight of the competitive bidding process, ICEA raises a concern regarding storage DER (as opposed to generation DER). ICEA urges that the Commission exercise its discretion and direct ComEd to competitively bid storage assets for the pilot project. Unlike generation, where ICEA argues that there are legal arguments that bar ComEd ownership, ICEA concedes that there are likely not legal prohibitions to ComEd owning and operating storage. Instead, ICEA recommends that ComEd treat storage DER the same way it is treating generation DER: the generation or other competitive market components will be the responsibility of the third-party owner / operator and the distribution component will be contracted for or leased by ComEd.

While ICEA notes that it did not present an expert on functionalization, ICEA highlights that multiple ComEd witnesses addressed the issue. ICEA points in particular to the testimony of ComEd witness Mr. Naumann, who provided the following explanation of functionalization:

> The costs that ComEd incurs to acquire rights to use DER for distribution purposes are distribution costs. Other costs incurred by the third party owner, and any revenues received by the third party owner, as a result of that DER performing other functions (e.g., making market sales in hours when the asset is not called upon by ComEd) are not distribution costs or revenues.

ComEd Ex. 13.0 at 10. ICEA also cites ComEd witness Mr. Naumann's testimony regarding storage:

> [The Federal Energy Regulatory Commission] ("FERC") has followed the definition of advanced transmission technologies set out in Section 1223 of the Energy Policy Act of 2005 to determine that energy devices can perform functions in addition to production, depending on how they are used. FERC recognized that batteries "do not readily fit into only one of the traditional asset functions of generation, transmission or distribution," and evaluated the specific functions the batteries at issue would perform, to determine that they should be functionalized as transmission assets.

Id. at 8. ICEA conjectures that microgrid storage would perform at least, in part, a distribution function (such as reliability), which should be procured by ComEd and recovered as distribution costs. Because storage can perform transmission and generation functions, argues ICEA, those functions should be outsourced to a third-party owner-operator—just as they are for generation DER. For those reasons, ICEA strongly urges the Commission to exercise its discretion to require ComEd to competitively bid storage DER.

E. Direct's Position

Direct states that in order to improve the chances for success of ComEd's competitive procurement of Project DER, the Commission should direct ComEd to make changes to increase bidder participation. As Direct witness Hawes testified, the greater the bidder interest and participation, the more competitive the procurement—which he testified would lead to better and more competitive bids. Direct posits that the Commission should focus on two categories of changes: bidder perception / bidder opportunity, and procedural fairness.

Direct states that ComEd made several concessions over the course of testimony and discovery. For instance, Direct highlights: "ComEd commits that no generating equipment, such as solar and natural gas generation, will be owned by ComEd." Direct Energy Cross Ex. 1 at 2. Direct avers that ComEd firmly and unequivocally committed to competitive bids for generation DER. Direct further highlights ComEd's commitment to one of two procurement structures: a contractual arrangement for the right to use DER upon request "analogous to a capacity right" or a lease. See, e.g., Direct Cross Ex. 1 at 2 (lease), 3 (capacity right). Direct emphasizes that ComEd explicitly abandoned its earlier recommendation that it should have the option to abandon the results of a

competitive procurement and revert to ComEd ownership of generation DER. ComEd Ex. 7.0 at 34.

Direct explains that ComEd also made some commitments with regard to RFP and pre-RFP procedures for the competitive procurement:

- Extending contracts with third party owner/operators for as long as ComEd intends to reserve the right to control generation DER, which at minimum will be the length of the pilot. See ComEd Ex. 15.0 at 12.
- Address specific terms of how ComEd intends to utilize DER in the contract itself, to the extent possible. See ComEd Ex. 7.0 at 35.
- Provide technical and data-related support for competitively bid DER equivalent to the support provided to interconnection customers and describe in contracts "how data related to ComEd's microgrid-related dispatch of Project DER acquired under third-party contracts is exchanged." Id.

Direct states that it is not aware of opposition to any of these commitments by any other party, and that each of them helped resolve an issue raised by Direct.

Direct states that although ComEd made commitments and modified its proposal for the better, Direct believes there is still room to enhance procedural fairness in ComEd's proposal through improving the competitive procurement process. Direct argues that these improvements are intended to increase the attractiveness of the process to potential bidders, without adding ratepayer cost or adversely impacting ComEd. Direct further argues that not only will these bids improve the procedural fairness of the RFP, but also increase bidder confidence in the process.

Direct requests that the Commission direct ComEd to include an RFI/RFQ process before the RFP ComEd has proposed for the competitive procurement. Direct witness Mr. Hawes explained the value of an RFI/RFQ as follows:

> First, it will give ComEd, the Commission, and other stakeholders comfort from the get-go that serious players are planning to bid. The RFQ process also allows reasonable input into the technical or other specifications that ComEd may not have thought of or overlooked inadvertently. Second, by allowing seasoned individuals or companies who have experience with microgrid development to see what ComEd is looking for and providing information that could refine the RFP process, it provides for a more sound and concrete RFP.

Direct Ex. 1.0 at 13. Direct argues that because bidders are not allowed to participate in the stakeholder process proposed by ComEd to provide input on RFP design, an RFI/RFQ would be the only avenue for bidders to provide technical feedback to ComEd. See Direct Ex. 2.0 at 7; ComEd Ex. 7.0 at 6 (noting broad invitation to participate in workshops "excluding bidders, of course"). Direct witness Mr. Hawes further testified that feedback from bidders in RFP design will provide ComEd with valuable "learnings" on

procurement, an area ComEd explicitly stated it was interested in collecting learnings. See Direct Ex. 2.0 at 7.

Direct notes that ComEd witness Svachula testified that he is concerned an RFI/RFQ would delay implementation of Phase I and would discourage bidders from participating. See ComEd Ex. 15.0 at 11. Direct concludes from Mr. Svachula's testimony that ComEd opposes Direct's RFP/RFQ recommendation. Direct concedes that it understands the importance of speed in Phase I, but Direct nevertheless notes that Mr. Hawes testified that an RFI/RFQ process would save ComEd time because it would only have to review proposals from pre-qualified entities. See Direct Ex. 2.0 at 7. Direct highlights that ComEd witness Svachula did not explain why he believed that an RFI/RFQ would discourage bidders, while Direct witness Hawes explained the benefits to both bidders and ComEd from even a quick-turnaround RFI/RFQ.

Direct notes that ComEd witness Mr. Svachula explained that ComEd could seek to abandon the results of a competitive procurement for DER for several reasons, including "if the bids received are so expensive that the costs would affect the overall cost structure of the Project or ComEd believes that accepting them would raise questions of prudence, ComEd reserves the right to lease the equipment instead." ComEd Ex. 7.0 at 34. Direct argues that this is a subjective standard, based on ComEd concerns about others' questions of prudence. Direct Ex. 2.0 at 5. Direct juxtaposes a more objective standard—such as the Commission-approved benchmarks for Illinois Power Agency standard product procurements—and Direct argues that there is no amount of market research or pencil sharpening by a potential bidder that would allow for a reasonable estimate of what ComEd's standard would be. Direct raises concerns that the subjective standard introduces substantial—for some, perhaps intolerable—uncertainty for bidders who may invest time and resources worth tens of thousands of dollars to respond to the RFP (particularly for the larger dispatchable generation facility).

Direct states that it is offering a commonsense solution wherein ComEd should publish a maximum bid value and how it arrived at that value. See Direct Ex. 2.0 at 5. Direct witness Hawes testified to the value of this approach:

> In a competitive high-participation bidding process, I would not expect bidding to cluster around the cap. Rather the whole purpose of the bidding will be driving in the lowest price/highest value offers as bidders compete against each other. The price cap if implemented could work to limit those who cannot come in under the cap from participating and cluttering the bids.

Direct Ex. 2.0 at 6. Direct argues that there would be little to no opportunity for gaming, because ComEd's maximum will be a maximum and bidders who try to exceed the maximum will find their bids rejected. Id. at 4. Furthermore, continues Direct, because the ceiling is based on ComEd's subjective perception of the risk that other parties may question the prudence of its expenditures, the ceiling is not competitively sensitive information.

Direct notes respectfully that it appears that ComEd witnesses did not fully engage Direct witness Mr. Hawes' proposal, resulting in inapposite counterarguments. Direct

states that it is unclear, for instance, how ComEd witness Svachula's suggestion that providing after-the-fact information about bidding in an annual report (or supplemental report) would alleviate the problem of bidders competing with an unknown, subjective bid ceiling. See ComEd Ex. 15.0 at 11. Direct also notes the objection of ComEd witness Hon. Susan Tierney, but Direct points out that Hon. Tierney's objection in the context of competitive DER bids where winning bidders are capped at a utility's avoided costs, which—unlike ComEd's perception of other parties' litigation strategies—is based on an objective standard, and thus inapplicable. ComEd Ex. 16.0 at 7. Direct further argues that unlike the traditional DER procurements to which Direct understands Dr. Tierney to be referring, the competitive procurement here for a (as ComEd terms it) "distribution capacity" product is certainly not a commodity or market-traded product and the same competitive concerns are not present.

Direct theorizes that perhaps ComEd was caught up on the request for information about ComEd's costs to develop and operate, the original standard that ComEd proposed to use to set a bid gap. Direct clarifies that it only wishes to know information about ComEd's cost to develop and operate to the extent that ComEd will use that value to set the ceiling. Direct, as a potential bidder that does not want to see potentially tens of thousands of dollars wasted based on an unknown and unknowable ceiling, simply requests that the ceiling be published. As an alternative, Direct offers that if ComEd is basing the ceiling value at least in part on cost- or value-based criteria, ComEd should share that information so potential bidders (through the RFI/RFQ) and other parties (through workshops) can share feedback.

Direct witness Mr. Hawes agrees with ICEA that storage should be competitively bid: "[t]here is a proper way to create distribution focused utility development of microgrids and that starts with a requirement that the utility bid out, at minimum, the generation and storage for third party construction, ownership and operation." Direct Ex. 2.0 at 10 (responding to ELPC/Vote witness Mr. Dean Moretton). Direct recommends that the Commission adopt ICEA's proposal that the Commission exercise its discretion and direct ComEd to competitively bid storage.

Direct notes that while Mr. Hawes testified that the Commission adopting his process improvement recommendations "will best ensure active and competitive bidder participation," Mr. Hawes further testified that "even the best design cannot necessarily guarantee results." Direct Ex. 2.0 at 6. Direct Energy concedes that in response to ComEd witness Mr. Svachula's concerns about unreasonable or excessively expensive bids, Direct witness Mr. Hawes testified that "I do not necessarily disagree with the concerns he raises." Id. at 5. Direct points to a solution testified to by Mr. Hawes:

> I recommend that ComEd focus on improving the competitive procurement process, and return to the Commission if ComEd believes that the results of the competitive procurement process are unacceptable for any reason. Based on the specific facts of the competitive bid and its results, the Commission can then approve a contingency plan.

Direct Ex. 2.0 at 6. Direct notes that ComEd has proposed a contingency plan in this docket, referred to sometimes as a "lease" and other times as a "capital lease" in which

ComEd would not own the generation. While Direct states that it would need to know more about the exact leasing arrangement—there is considerable diversity of rights and responsibilities between lessor and lessee within the broad category of "lease"—Direct concedes that it does not oppose ComEd's contingency plan as an option. However, Direct proposes that in addition the Commission look at why the competitive procurement failed to yield results, and what impact that would have (if any) on approving ComEd's proposed contingency.

Direct expects ComEd would design and execute the competitive procurement in a fair manner. However, other bidders and interested parties (from the bidder itself to potential subcontractors and financiers) may not know ComEd well enough to give it the benefit of the doubt. Direct posits that all parties benefit from a high-participation bidding process, and of critical importance is the confidence that ComEd would only exercise its contingency plans to lease DER under Commission-approved circumstances. Direct concludes that with Commission oversight, parties less familiar with ComEd (especially those who do not directly interact with ComEd) will have greater confidence in the process, and thus will be more likely to expend resources to bid and bid aggressively.

F. CUB/EDF's Position

CUB/EDF initially expressed concerns regarding the inclusion of fossil fuels in the project as well as the ownership of DER. CUB/EDF Ex. 1.0 at 5-6. In response to the concerns expressed by CUB/EDF and other stakeholders, ComEd revised its position on rebuttal. In addition to other commitments, the Company agreed that a primary learning of the Project would be efficient integration of distributed generation on the distribution system. ComEd Ex. 7.0 at 20-21; ComEd Ex. 9.0 at 23. ComEd further committed that it will utilize private, third-party owned DER rather than owning the assets itself. ComEd Ex. 7.0 at 6. Only if no reasonable bids are submitted will ComEd lease DER resources. Id. at 33-34. These commitments satisfied the concerns of CUB/EDF with respect to Phase I.

G. Commission Analysis and Conclusion

ComEd initially proposed that it would either acquire the rights to use the DER included in its microgrid or lease the equipment from a third party. In the event those options were not available at prudent cost, the Company proposed to own the DER outright. After considering Staff's and the intervenors' objections to owning the generation assets, ComEd has pledged to not own the generation and only lease the assets if an economic option to use third party DER is not available. The Commission agrees with Staff and the Company that this is a reasonable proposal. The Commission approves the RFP workshop concept proposed by ComEd which promotes substantial collaboration amongst the Company and non-vendor stakeholders. The Commission also approves the selection criteria outlined by ComEd.

The Commission agrees with ICEA regarding oversight of the competitive procurement process in the event that ComEd seeks to abandon the results. The Commission is confident that ComEd would only seek to abandon results when the facts justified that step, and thus the Commission anticipates that in the event such a review is necessary it should be straightforward and conducted in an expedited fashion in a non-

docketed proceeding. The Commission also adopts ComEd's proposal to the extent that ComEd would provide a special report to the Commission in the event that ComEd seeks to abandon competitive procurement results for any reason. The Commission believes this will cause little harm to ComEd, but increase bidder confidence - particularly bidders who have less experience with ComEd.

The AG asks the Commission not to make any conclusions about the prudence, reasonableness or viability of Phase I or Phase II of the Project until the cost and other terms governing the procurement of DER are established. The Commission agrees with ComEd that since the reasonableness of any expenses incurred in a DER procurement will be determined in a future rate case, it is not inappropriate or premature to establish the terms of such a procurement in this Order.

The Commission rejects the two recommendations proffered by Direct. First, the Commission agrees with ComEd that requiring a RFQ/RFI will cause undue delay and will not provide substantially more information than will be required in the RFP ultimately released. Second, publishing a maximum bid would incentivize parties to bid as high as they could to come close but not exceed that ceiling, which may not produce reasonable, cost-effective bids.

The Commission also rejects ICEA and Direct's proposals to competitively bid storage. ComEd states that it must own the battery energy storage in order to properly control and operate those assets. Given that the testing and operation of storage is such an integral part of the DOE study, ComEd states it would not make sense to have third-parties own or operate this component of the Project. The Commission agrees with ComEd that storage cannot be practically procured in the same way as non-storage DER generating equipment. The Commission finds that ComEd must possess access to the monitoring and control functions of the storage device, including an open protocol with communications access to allow it to test and implement new inverter control algorithms being developed in the SHINES project and to accomplish the critical distribution function to maintain the necessary reliability and resilience of the microgrid area.

The Commission agrees with ELPC/Vote that the Project should incorporate more renewable distributed energy resources, and that the learnings associated with Phase II are somewhat diminished by the use of fossil fuel generators, especially diesel generators, rather than solar PV and batteries. ELPC BOE at 6-9.

As recognized by many of the parties to this case, the electrical grid is evolving towards the integration of increasingly high levels of DERs. With the passage of the Future Energy Jobs Act (FEJA), the State of Illinois has also expressed strong support for the development of carbon free sources of energy including the creation of robust targets and incentives for the deployment of solar PV especially including community solar and in low-income areas. Among the most important drivers of this project—in the Commission's view—should be the development of innovative solutions, and experience in the design and operation of distribution resources that allow the management of decentralized, multi-directional power flows to accommodate high-penetration of DERs. ComEd Ex.1.0 at 1-2. ELPC BOE at 6. CUB RBOE at 2.

In addition to developing technical experience, incorporating higher levels of DERs will afford an opportunity to define metrics and generate data that will aid the Commission and inform future policy decisions regarding these resources.

The Commission, however, agrees with ComEd that no "decision" has been made and the procurement process will determine the amount of renewable generation in Phase II. ComEd RBOE at 31. This procurement process shall consider, as a factor, the environmental attributes of the proposals. The Commission urges ComEd to explore using less fossil generation (including the elimination of diesel generation) and more distributed solar and batteries while also balancing the costs of the resources necessary to supply the Project area. The Commission requires ComEd to work with Staff on proposals to integrate higher levels of renewable DERs, and lower carbon emitting alternatives to diesel in the Project, which shall be presented to the Commission as a Staff Report due no later than 120 days after the Final Order.

IV. PRUDENCE/REASONABLENESS OF THE PROJECT AND ANY OTHER APPLICABLE STANDARDS

A. Prudence/Reasonableness

1. ComEd's Position

ComEd asks the Commission to find that it is prudent and reasonable for ComEd to undertake the Project. ComEd argues that the Commission has authority to determine the prudence of demonstration programs, and that the evidence demonstrates that it is prudent and reasonable for ComEd to undertake this pilot to better understand the design, performance, and benefits of microgrids. ComEd contends that failing to pursue these learnings would place it in a position of reacting to, rather than planning for, changes on the system in the future.

ComEd notes that DER penetration is growing and that ComEd must plan and operate its system to accommodate new types of power flows, including both injections and withdrawals on distribution feeders. ComEd also submits record evidence finds that microgrids are a promising tool to increase the reliability and resiliency of the grid, and argues that understanding how microgrids and microgrid technologies operate is a crucial component of maintaining and advancing service in a decentralized, multi-directional grid. ComEd points to the DOE's award of two sizeable grants as evidence that the DOE supports the innovative nature of the Project and the significant value of the learnings to be gained. ComEd states the learnings ComEd gains from the Project will improve grid operation and planning, regardless of whether ComEd or third-parties own and operate microgrids or DER in the future.

ComEd states the established legal standard for prudence is clear. Prudence is "that standard of care which a reasonable person would be expected to exercise under the same circumstances encountered by utility management at the time decisions had to be made." Ill. Power Co. v. Ill. Commerce Comm'n, 382 Ill. App. 3d 195, 201 (3d Dist. 2008) ("Illinois Power"). ComEd proffers that experienced utility managers can and do regularly make decisions, especially with respect to questions such as the value of future learnings, in the face of uncertainty and based on judgment, even when benefits cannot

be then reduced to quantified dollar values. ComEd maintains the Commission must holistically evaluate the factors that inform utility management, and determine whether all those factors taken together indicate that the Project is prudent and reasonable. Ill. Power Co. v. Ill. Commerce Comm'n, 339 Ill. App. 3d 425, 440-43 (5th Dist. 2003) ("Ill. Power Co."). ComEd emphasizes that the Commission itself commonly accepts and approves – and in some case requires – that utilities engage in many critical initiatives ranging from supplier diversity to public safety without expecting or demanding that the benefits be monetized and quantified.

ComEd maintains that, when the well-established legal standards for prudence and reasonableness are applied to the facts in the record, it is clear that the Project should be approved. ComEd asserts the parties' various arguments to the contrary are entirely unsupported by the law and entirely ignore a substantial, uncontroverted, portion of the evidence presented. ComEd notes no party disputes that DER interconnections with the grid are growing, or that increasing penetration of DER requires ComEd to plan, design, and operate its system in new and innovative ways to manage decentralized, multi-directional power flows. No party disputes that microgrids, and the technology used to deploy them, are likely tools in managing this monumental task. Further, no party disputes that microgrids can provide increased resiliency, or that microgrids and microgrid-enable technologies are capable of mitigating the impacts of cyber and physical attacks or weather events. In fact, no party disputes that the Project will provide an opportunity for ComEd and the industry to learn about the design and operation of the grid, or the impact of increased resiliency.

ComEd states the dispute in this proceeding concerns the magnitude of the value of the opportunity to learn. ComEd maintains, the evidence on that point is clear and supports the prudence and reasonableness of the Project. ComEd explains that the Project is intended and designed to produce learnings regarding the value of a microgrid across the entire range of utility customers, and to produce learnings that will advance the current state of microgrid design, operation, and integration with the utility system, not to mention the distribution system more broadly. As the owner and operator of the distribution system on which 3.9 million customers depend, ComEd states it needs to learn about and understand the interfaces and interactions between its distribution system, microgrid systems, and DERs, including those owned and operated by others. In the absence of the Project, ComEd states it would be reacting to other parties' installation and operation of microgrids and DERs on the ComEd system. The Project enables ComEd to obtain these learnings, which ComEd maintains will be important whether or not it ever deploys another microgrid on its own initiative. ComEd explains such learnings will be available for use by other distribution utilities and customers seeking to install and/or operate their own microgrids.

ComEd also contends that demonstration projects are important, recognized tools for promoting innovation and learning, and they should be evaluated on that basis. Across the country, there are countless examples of successful pilot programs and/or demonstration projects, including those that test new and innovative technologies and systems, efficiency and demand response programs, and customers' responses to new rate designs, among many other things. ComEd states such pilots and demonstration projects help organizations and regulators learn whether larger-scale, more-permanent

or longer-term deployments might be worthwhile and, if so, to learn more about how to take those steps. ComEd maintains that those proven benefits should be encouraged, especially at a time of significant change like that occurring in the electric industry now.

ComEd asserts that demonstration projects also should not be judged using the same regulatory standards and rules applied to wide-scale operational deployments. ComEd explains that, while demonstration projects are aimed at gaining beneficial information, wide-scale operational deployments benefit from and use information gained in prior experiments. Because wide-scale operational deployments build on prior learnings about costs and benefits, ComEd states the costs and benefits of such deployments can be quantified. In contrast, ComEd explains, a demonstration project cannot be fairly judged on its operational costs and benefits alone, neglecting its learnings (which are inherently difficult to quantify in advance).

ComEd asserts that the Commission should reject Staff's and the AG's arguments that a Commission determination of whether it is prudent and reasonable to proceed with the Project must be based on a finding that its benefits exceed its cost. ComEd states that neither Staff nor the AG cited any legal precedent supporting this purported standard. ComEd argues that a quantified cost-benefit analysis is not a prerequisite for a finding of prudence. Ill. Power Co. at 425. ComEd does not dispute that, in general, prudent projects have benefits or reduce costs or risks. Here, ComEd maintains it has repeatedly demonstrated that this Project will be beneficial in myriad ways – in the form of learnings and experience regarding distribution system design, and in the form of increased resilience and reliability. ComEd argues there is no legal or logical requirement that the Commission must base a determination of prudence on quantitative data indicating that benefits exceed costs.

ComEd similarly states the Commission should reject Staff and AG suggestions that ComEd has not identified a generally-accepted methodology to place a value on an opportunity to learn. ComEd maintains the absence of a method for valuing an opportunity to learn does not imply that learnings have no value. ComEd notes Staff's own witness agreed that "determining how to balance distributed generation with load in a microgrid seems to be a valuable investment," and that "a larger microgrid generates more data, which is more valuable." Staff Ex. 1.0 at 6; Staff Ex. 4.0 at 4. ComEd notes Staff witnesses agreed that there is no methodology for valuing the opportunity to learn. Staff Ex. 5.0 at 3; Staff Ex. 4.0 at 7.

ComEd states the Commission should reject Staff and AG suggestions that the Commission should compare the proposed Project against other methods of achieving similar results, in order to determine whether the Project is the most cost-effective means. However, ComEd states the alternative configurations they suggest for the Project will not achieve the same learnings or offer the same resiliency benefits as will the Project. ComEd argues the Commission should disregard alternatives that do not achieve the goals of the Project. See, e.g., Union Elec. Co., Docket No. 01-0516, Order at 12-13 (Jan. 15, 2002) (finding that construction of peaking plant was the least-cost alternative where other options would not timely address a shortfall in capacity); Ameropan Oil Corp. v. Ill. Commerce Comm'n, 298 Ill. App. 3d 341 (1st Dist. 1998) (holding, where two alternatives are available, one of which meets a service need more timely than the other, Commission acts reasonably by approving the more timely route). At the very least,

ComEd argues, the Commission should recognize that, although those alternatives are designed to be cheaper, they are also markedly inferior.

ComEd states the Commission should reject AG attempts to undermine the value of the learnings the Project can provide in light of what the AG characterizes as the established purpose of existing microgrids to provide reliability to critical facilities. ComEd contends this is a red herring. ComEd explains that providing reliability to critical facilities is certainly one use-case for a microgrid, but it is equally not the only use-case. The Project, in particular, is not designed to test a one-customer microgrid concept aimed at providing backup supply to a handful of customers while the surrounding area lacks service and area DER has no way to contribute. ComEd explains the Project will also evaluate the positive impact that improved resiliency can have on the entire range of customers within the Project area and the impact that a resilient oasis can have on the larger community in a disturbance. Again, ComEd maintains these learnings cannot and will not be developed in the context of existing microgrids that serve only critical customers; a microgrid that incorporates a diversity of customers, load profiles, and power flows is a prerequisite.

ComEd notes the AG also argues a variant of this position: that the cost of the Project must be compared to the cost of a microgrid that serves only the critical customers in the Project area, in order to support a finding that the Project is prudent and reasonable. ComEd responds that the Project is not designed or intended only for customers with critical power needs, but is designed to ensure the community in the Project area can continue to function at peak capacity even during disruptions on the broader grid, including both those customers that can provide critical services to the wider area, and homes and businesses on whom the entire community might rely to rebuild following a significant event. ComEd states the impact of the Project on customers that are not considered "critical" is among the key learnings ComEd hopes to obtain from the Project and data collected from those customers will be useful for that analysis. ComEd explains the goals of a microgrid include security and resilience, meaning not only the ability to prepare for and mitigate major extreme events and disasters, but also the capacity of individuals, institutions, businesses, and systems to sustain and recover from chronic stresses and acute disturbances. ComEd states these broad values of the Project cannot be achieved by only including critical infrastructure within the microgrid. ComEd contends comparing a microgrid that forsakes those benefits – including the significant Project learnings – is a spurious comparison. ComEd asserts the Commission should reject the AG's attempt to evaluate the Project based on such a comparison.

ComEd also states that the Commission should reject the suggestions of Staff and ELPC/Vote that the Commission approve a smaller microgrid. ComEd contends the record reflects a correct balance between learnings and cost. ComEd states that, since Phase I does not include clustering and would incorporate far fewer customers and critical customers, Phase I will not produce learnings or benefits of the same value that the Project will produce. Because only a portion of the learnings will be available at the conclusion of Phase I, ComEd maintains pausing the Project at Phase I to conduct additional evaluation will not be an effective use of resources.

ComEd further states that it is possible to reconfigure the Project to include a smaller footprint; but doing so would significantly reduce the value of the learnings that

can be obtained from the Project. ComEd explains that Staff's proposed additions to the Phase I configuration do not change the transitional nature of Phase I, do not meet other key technical characteristics (e.g., sensors and topology), and do not include key customers and facilities. ComEd states Staff's proposal also does not include all of the CPD headquarters, one of the most critical public service facilities in the City of Chicago. In addition, ComEd states Staff's limited configuration does not incorporate or study microgrid behavior on a full feeder and limits the opportunities for installing, operating, and studying control and measurement devices. In short, ComEd explains, the smaller microgrid Staff proposes (the Phase I configuration, augmented with additional permanent DER and the interconnection to IIT) would cost more than half of the total Project cost, and yet it would significantly limit the learnings and resiliency benefits available from the Project.

ComEd considered modifications to Staff's configuration that would add to the Phase I footprint the full CPD headquarters and the geographic area between the Phase I footprint and the existing infrastructure that would be used to interconnect with CPD headquarters. ComEd states that, in comparison to the Phase I configuration, this configuration includes: (i) 3 MW of load and DER, an increase of 120% over Staff's configuration; (ii) approximately 95 customers, including three providing critical public services, in addition to the CPD; and (iii) additional DA devices and PMUs, which provide increased visibility and control granularity. However, ComEd explains, even these augmentations to Staff's configuration do not result in a practical or cost-effective alternative. While the additional work (above and beyond Staff's proposal) would allow ComEd to capture many of the learnings of the full Project, ComEd states it would include approximately 475 fewer customers and three fewer customers providing critical public service, 1.5 MW less load, and less third-party non-storage DER than the Project as designed. ComEd explains the reduced load and DER would reduce the ability of the Project to support the neighboring IIT microgrid through clustering. The learnings and customer benefits associated with an incomplete Project would remain significantly less than those associated with the full buildout. ComEd stresses that to achieve even that limited set of benefits would require expending nearly 90% of the cost of the full Project. The augmentations to Staff's configuration would bring the cost of the Project within approximately $3 million of the cost of ComEd's proposal, or to more than $20 million.

ComEd also states the Commission should reject Staff's statements questioning the extent of market demand for utility-scale microgrids. ComEd notes Staff provided no evidence to suggest that the use-cases for utility-scale microgrids are limited. ComEd contends the record reflects that future utility-scale microgrids, within ComEd's territory or elsewhere, will likely be on the same scale as the Project using full feeder configuration. ComEd adds that Staff does not dispute this expectation. Moreover, ComEd asserts that the record reflects that a demonstration project of this scale is prudent, because it allows ComEd to evaluate alternative, smaller sectionalized configurations. According to ComEd, learnings gained through the full-feeder configuration will support the implementation of future operation and control schemes to dynamically isolate and island feeders using local generation resources. ComEd explains that incorporating a full feeder within the Project allows ComEd to sectionalize and create multiple configurations, which can, for example, be compared against each other to gain operational and design learnings for optimal microgrid design under a variety of operating scenarios. ComEd

states a smaller microgrid would not allow for as many sectionalized configurations, and would therefore limit the available learnings. Likewise, ComEd explains the Project enables a variety of operational scenarios involving the interconnection of third-party-owned non-storage DER on the system. ComEd states the learnings from these operational scenarios can be applied across the distribution system, as more DER is interconnected with the grid.

2. AG's Position

The AG refers to the Act's express prohibition against including imprudent and unjust and unreasonable costs in rates, and the Act's requirement that utilities provide service that, among other requirements, is least cost. 220 ILCS 5/9-201(c); 220 ILCS 5/8-401. The AG further supports Staff's position that a prudence finding requires that the microgrid's projected benefits are greater than its projected costs, and emphasizes Staff's point that it is vital that the benefits of the project outweigh the costs as nothing requires ComEd to construct the microgrid to meet its obligation to deliver electricity to its customers. If the project does not generate sufficient benefits to defray ComEd's costs of construction, customers are worse off. The AG agrees with Staff that whether an investment's benefits outweigh its costs is at the core of a prudency determination. The AG further maintains that a reasonable person would not invest $25 million unless it is clear that the benefits of the investment exceed the cost.

The AG asserts that notwithstanding the need to show how the project will benefit customers who are being asked to pay for the Project, ComEd admitted that the Company will not be able to analyze sufficient data from the project to develop an initial cost-benefit analysis until 2020. In other words, it will take two years to have sufficient information to be able to determine whether "the microgrid's benefits exceed its costs" making it impossible for the Commission to conclude that it is prudent to embark on the project.

In response to ComEd's argument that the "learnings" associated with the project will provide sufficient benefits to justify the cost, the AG points out that it is unknown if ComEd will have the opportunity to "learn" from an islanding event, because no one knows when or how often such an event will occur. The AG further concludes that the Project design would not capture several of the claimed learnings, such as providing power to critical facilities during a "major event" and providing support for neighboring communities. The AG further argues that ComEd's Project fails the Illinois Power definition of "prudence" because there has been no showing that it is needed or how often it will be used. The AG notes that ComEd currently provides reliable service in the microgrid area that is already better than the ComEd grid as a whole, and much better than the U.S. average. Further, ComEd has not identified any incidents in the microgrid area or elsewhere on its system where customers were without service due to inability to reach the substation or transmission system rather than because of more local interruptions on the distribution system from things like trees, animals, or local equipment malfunctions. The lack of identified problems in the project area lead the AG to suggest that ComEd's Project is a solution in search of a problem.

The AG responds to ComEd's position that it need not show that the benefits of the investment will exceed the costs. While ComEd cited Ill. Power Co., the AG argues that case is not on point. In that case, the Court reversed a Commission order finding

that Illinois Power's decision to retire an obsolete propane plant that required major and expensive upgrades was not prudent because the utility had not conducted a cost-benefit analysis of retiring the plant. The court stated that Illinois Power had retired four other propane plants in similar situations in the prior six years without conducting a cost-benefit analysis, and the Commission found those decisions prudent. Ill. Power Co. at 439. Given that the Commission had not required that a cost-benefit analysis be performed before retiring the other four plants, the court found that "there would have been no reason, based on past experience, that a 'reasonable person' should have concluded that a [cost-benefit] was necessary as a part of prudent decision-making." Id. The AG asserts the Project at issue in this case is very different as it does not involve the retirement of the last of five obsolete propane plants. On the contrary, the AG notes that ComEd has presented the Project as "innovative," using "cutting-edge technologies." These characteristics make a cost-benefit analysis essential to assure that the expenditure is prudent and reasonable.

The AG also provides an analysis of two other cases cited by ComEd: Wilcox v. Ill. Commerce Comm'n, 23 Ill. 2d 432, 440 (1961) ("Wilcox") and Gernand v. Ill. Commerce Comm'n, 286 Ill. App. 3d 934, 944 (4th Dist. 1997) ("Gernand"). The AG maintains that while the Wilcox case allowed the Commission discretion to authorize an experimental gas storage project, the Court emphasized that its decision "is confined to the Gas Storage Act and has no relation to the requirements of the Illinois Public Utilities Act." Wilcox, 23 Ill. 2d at 439. The Gernand case similarly bears no resemblance to the issues in this docket. In Gernand, landowners challenged a Commission order granting a water utility's request for the right of eminent domain to conduct "test-boring surveys to find groundwater, construct test wells, extract groundwater, and measure the effect of removing groundwater on the water supply in a rural area of Vermilion County, Illinois." Gernand, 286 Ill. App. 3d at 936. The utility was required to bring its water supply within the federal primary drinking standards within five years, and used the test-boring to find water that would comply with federal regulations. Id. at 937. The "test"-drilling was necessary to its core business – finding and providing primary water to its customers to comply with federal regulations, but did not involve a pilot project. The AG points out Gernand is not relevant in that the ComEd Project does not involve eminent domain, is not a required utility function, is not required to provide reliable service, and is discretionary.

In response to ComEd's argument that the benefit of the project is "learnings," the AG cautions that notwithstanding assertions about the future use of utility-scale and full feeder microgrids as an overlay to its distribution system, Company witnesses vowed that the utility has no plans to build additional microgrids. If true that ComEd has no plans to use microgrids in the future, it is imprudent for ComEd to ask its customers to subsidize "learnings" that will be disseminated to third-party DER and microgrid developers.

The AG concludes that the high cost of the microgrid and ComEd's failure to quantify the purported benefits ratepayers would realize show that the Project is not cost-effective, is not prudent, and it would be unreasonable for the Commission to approve it.

3. Staff's Position

Staff states that it is clear that ComEd is not required by statute to undertake the construction of the microgrid, nor is the microgrid required to provide reliable service. Staff Ex. 1.0 at 5; ComEd Ex. 1.0 at 16-17. ComEd's basis for constructing the microgrid does not include reliability or statutory requirements. Accordingly, the Commission must determine whether ComEd's decision to construct the microgrid is reasonable and prudent based upon whether the benefits exceed the cost. Staff Ex. 1.0 at 5-6.

Staff offers that Section 9-211 of the PUA provides in relevant part that "[t]he Commission … shall include in a utility's rate base only the value of … investment which is both prudently incurred and used and useful in providing service to public utility customers." 220 ILCS 5/9-211. Staff asserts that although the words "prudently" and "prudence" are not defined in the Act, it is accepted that prudence "is that standard of care which a reasonable person would be expected to exercise under the same circumstances encountered by utility management at the time decisions had to be made." Ill. Power Co. at 428.

Staff continues that if a contemplated investment is not needed, or if there is a need for such an investment but a less costly option to satisfy the need is evident, then the contemplated investment is not prudent. Staff Ex. 2.0 at 4-6. ComEd's proposed investment in a microgrid is not necessary to serve customers. Nonetheless, there is a case to be made that the benefits ComEd might obtain from the microgrid (to which ComEd refers as "learnings") might justify some part of the project investment, on the theory that "necessary" in the context of utility regulation does not always mean indispensable. "If [a utility service or facility] is needful and useful to the public it is necessary." Eagle Bus Lines v. Ill. Commerce Comm'n, 3 Ill. 2d 66, 78 (1954), quoting Wabash, Chester & Western R.R. Co. v. Ill. Commerce Comm'n, 309 Ill. 412, 418 (1923). Moreover, necessity includes future needs. Wabash Chester & Western R.R. Co., 309 Ill. at 418-19; Gernand, 286 Ill. App. 3d at 936, 943-44 (Certificate of Public Convenience and Necessity for finding new sources of water supply was properly granted).

Staff acknowledges that ComEd's proposed Phase I is a relatively small microgrid. One important purpose of the first phase is to certify/prove that ComEd's MMC can safely operate in "island mode" or when the microgrid is not interconnected with ComEd's grid. ComEd Ex. 2.0 at 11-14. The total load in Phase I equals 2.5 MW, supplied in island mode by 750 kW of solar panels, 0.5 MW/2MWh of battery storage and 3 MW of temporary, mobile diesel generators. ComEd Ex. 1.0 at 26. Phase I is funded by grants from the federal government and various public and private partners, as well as ComEd. ComEd Ex. 1.0 at 30-31. As a result, the total cost to ComEd, and therefore its ratepayers, is equal to $7.8 million. ComEd Ex. 2.0, 17. Because the total cost to ratepayers is relatively low (due to funding from outside parties), and the information gleaned from operating a microgrid appears to be valuable, Staff believes that Phase I costs are reasonable and prudent. Staff Ex. 1.0 at 6.

Staff points out, however, that ComEd's proposed Phase II more than doubles the microgrid's demand to 7 MW and intends to interconnect to IIT's existing microgrid. Staff concedes that the learnings generated by clustering with another microgrid are valuable. Yet, the increased size and scope of the microgrid's demand comes at a considerable

increase in expenditures, the cost of which ratepayers would have to bear. The estimated incremental cost for Phase II is $17.2 million. ComEd Ex. 2.0 at 17. Staff stresses that ComEd has not attempted to quantify the value of the incremental learnings to be gained strictly from Phase II of the Project. ComEd argues that it is not possible to quantify the value of that information. ComEd Ex. 10.0 at 4. Because of ComEd's uncertainty as to the value of the Phase II learnings, Staff cannot attest to the Commission that the benefits of Phase II exceed the costs.

Staff submits that a less-costly option to ComEd's proposal can and should be pursued. Specifically, rather than constructing a demonstration microgrid project that encompasses the geographic area of both Phase I and Phase II, as contemplated by ComEd, a far more economical demonstration microgrid project can be constructed. Staff proposes a modified Phase I that covers the area footprint of Phase I and includes an interconnection with the IIT microgrid along with adequate permanent controllable DER to supply the full 2.5 MW of load that exists therein. Staff Ex. 2.0 at 9-10. This less-costly microgrid would enable ComEd to obtain most of the learnings and operational experiences available from a larger microgrid at approximately half the cost to ratepayers. ComEd Ex. 9.0 at 7.

Staff notes that ComEd objects to reducing the scope of the Project because it believes doing so would result in reduced learnings. Id. ComEd further asserts that the value of learnings cannot be quantified because it is not possible to identify in advance the precise learnings the Project will generate. ComEd Ex. 7.0 at 4. Staff responds that despite ComEd's objections, ComEd has not clearly specified what it hopes to learn and has not identified a generally-accepted methodology to place a value on an opportunity to learn. Staff concludes that it is not clear that incremental learnings associated with Phase II warrant an estimated $12 million increase in project costs to ratepayers. Staff Ex. 5.0 at 4-5. Staff suggests that if ComEd is able to successfully construct and operate a smaller-scale demonstration microgrid, and if need for expansion beyond the Phase I footprint exists, ComEd could, at such time, request that the Commission authorize such expansion. Staff Ex. 2.0 at 10. In this docket, however, since only prudent investments can be included in a utility's rate base, Staff recommends that the Commission approve the reduced-scope demonstration microgrid recommended by Staff, and which ComEd acknowledges could operate as a microgrid and satisfy the requirements of the DOE grants. Staff Ex. 5.0 at 3.

Staff recommends, however, that if the Commission decides to grant ComEd approval in this proceeding for the expanded demonstration microgrid that it proposes, then the Commission should require ComEd to file certifications demonstrating that Phase I of the Project is successful prior to any authorized expansion; ComEd agrees to this. Staff Cross Ex. 1.0. Furthermore, any such pre-approval of expansion should expire within a reasonable timeframe. ComEd and Staff agree to December 31, 2021. Staff Ex. 5.0 at 5.

Staff states that it is simply not possible to precisely quantify the ultimate benefits of an investigatory project such as this until it is over and the learnings are known and used. Staff submits that it is difficult to see how the Company can confidently state that the proof offered of the value of the benefits of the Project is overwhelming without actually offering such proof, or quantifying such benefits. ComEd is certain that the

benefits are substantial, but it has repeatedly failed to provide quantifiable evidence of their purported value, nor has it attempted, even generally, to quantify the ultimate benefits, other than as vague "learnings." Staff continues that while ComEd has elected to quantify the costs of the microgrid as "pennies" per customer per year, ComEd has four million customers, so that the benefits per customer per year seem likely to be similarly modest, especially where, as here, ComEd is unprepared to even identify them or estimate what they might be. Finally, Staff notes, ComEd does not need the Commission's permission to construct its microgrid. Staff explains that ComEd seeks permission to recover the costs of constructing the microgrid from its ratepayers. Staff concludes that if ComEd is confident that the benefits are so obviously substantial, it can undertake the Project without Commission approval for recovery of its costs and demonstrate at a later date that these costs were indeed prudently incurred.

4. ELPC/Vote's Position

ELPC/Vote claims that ComEd fails to develop the policy framework for this project. The sequence for analyzing microgrids should be: (a) establish a transparent process for distribution system planning whereby the needs of the grid are assessed and the most prudent way of meeting those needs are approved for cost recovery; (b) develop a framework for measuring whether the grid is sufficiently resilient, determining where resiliency gaps are and the monetary value to specific customers and the public at large of improving resiliency; and (c) authorize a range of pilots to establish metrics so that resiliency services provided by the utility or third parties can be appropriately compensated and to ensure the costs of those measures are distributed in an equitable manner.

ELPC/Vote note that they, CUB/EDF and Staff agree that ComEd's Phase I proposal meets the prudence standard and that Phase II does not. As CUB/EDF witness Barbeau notes:

> [T]he Phase 1 microgrid expanded to include a small controllable generator would provide all the learning of a larger microgrid. The benefits from unaccounted for energy would be the same, and the costs would be significantly lower. Phase 1 serves most of ComEd's identified critical infrastructure in the neighborhood, so most of the resiliency benefits would be realized. In addition, just constructing Phase 1 would mean the overall percentage of clean energy would be much higher than a microgrid with Phase 2's 7MW fossil fired generation. This also allows ComEd to comply with SHINES grant requirements.

CUB/EDF Ex. 1.0 at 6. ELPC/Vote agree with Mr. Barbeau's conclusion regarding Phase I.

However, in regards to Phase II, ELPC/Vote highlight that the parties reach a different conclusion. ELPC/Vote witness Moretton argues:

> ComEd's rebuttal testimony fails to make a convincing case that Phase 2 is required for learning given that many other

> microgrids have already studied these issues. IIT's microgrid is an existing example of ComEd's proposed microgrid, which only differs from IIT's microgrid because 2 microgrids will be connected, not because it controls solar PV.

ELPC/Vote Ex. 2.0 at 6. ELPC/Vote finds that Staff witness Rockrohr reaches the same conclusion:

> A microgrid of a size that is determined by the Phase 1 boundary would satisfy DOE grant requirements and allow testing of the microgrid master controller ("MMC"), including clustering with IIT's microgrid. The MMC is vital for nearly all microgrid operations but has not yet been placed in service, is unproven, and it is not known whether it will function as expected when connected to ComEd's distribution system and/or the IIT microgrid. It is not reasonable or prudent to carry out an expansion of the microgrid, as contemplated in Phase 2 of ComEd's proposal, prior to determining whether the MMC is capable of functioning as planned.

Staff Ex. 2.0 at 9. ELPC/Vote states that CUB/EDF witness Barbeau similarly concludes the Commission should instruct ComEd to reconsider elements of Phase II:

> I recommend that, prior to approval of Phase II, ComEd should engage stakeholders and the Commission to reconsider its approach to Phase II to answer core questions about a microgrid regulatory framework, and design Phase II around pilots, experiments, and evaluations to test the answers to those core questions in a real-world setting.

CUB/EDF Ex. 2.0 at 12.

ELPC/Vote further argue that the CUB/EDF settlement with ComEd bears no relationship to prudence. ELPC/Vote explain that CUB/EDF now support approval of the entire project in return for a number of commitments regarding future microgrids. Essentially, CUB/EDF concede on issues in this proceeding in order to avoid many of the same flaws in future proposals. Specifically, ComEd agrees to work with CUB/EDF to consider the goals of Mr. Barbeau's testimony and develop a new pilot for 2020. CUB/EDF Cross Ex. 1.0. ELPC/Vote assert that while this may seem like a reasonable deal in theory, it bears no effect on this case where the Commission must find this specific proposal prudent. The Commission must review this Petition on its merits to protect the current ComEd customers who will pay for this project. CUB/EDF witness Barbeau concludes at the end of his rebuttal testimony that he still opposes Phase II (CUB/EDF Ex. 2.0 at 15), and that the CUB/EDF agreement does not address his concerns about the current project.

ELPC/Vote argue that ComEd has not met its burden of proving that Phase II is prudent. The prudence review is arguably the most fundamental and important task of the Commission. As explained by Staff, "prudence" ultimately boils down to whether or not the benefits of a utility expenditure exceed its costs. ComEd frames the benefits

primarily as "learnings" that "cannot be itemized or quantified before they are studied and known." To an extent, ELPC/Vote agree that "learnings" from demonstration projects may be difficult to precisely identify and quantify in advance. However, this does not mean that the Commission should write a blank check any time a utility promises to "pilot" a technology that may generate some "learnings." ELPC/Vote contend there must be some standard to determine whether the potential benefits are worth the costs, and this is an important reason why they, Staff and the AG oppose Phase II of this project.

ELPC/Vote stress that the legal standard in this case is clear. The PUA places the "burden of proof to establish the justness and reasonableness" of the project squarely on the utility. 220 ILCS 5/9-201(c). As Staff explains, ComEd has failed to meet its burden in this case. Not only has ComEd "not clearly specified what it hopes to learn," but ComEd has not even "identified a generally-accepted methodology to place a value on an opportunity to learn." Accordingly, Staff concludes that ComEd has failed to give the Commission any way to determine whether the "incremental learnings associated with a Phase II expansion warrant an estimated $12 million increase in project costs to ratepayers."

ComEd argues that the Commission "has a long history of approving innovative technology pilots" and that "the Commission has the authority to determine the prudence of experimental and demonstration programs." ELPC/Vote do not dispute that the Commission has authority and discretion to approve demonstration projects. ELPC/Vote state that the cases cited by ComEd, however, highlight the importance of the Commission carefully exercising this authority to ensure that ratepayers' money is spent prudently, even for pilot projects. Utilities still must meet their statutory burden to justify the prudence of their investments. For example, Wilcox, cited by ComEd, does not support a relaxation of the utilities' burden of proof in cases involving "experimental" projects. Wilcox found that the Commission exercised "sound discretion" in approving the project, even though Plaintiffs characterized the project as "experimental." Wilcox, 23 Ill. 2d at 440. Notably, the Court found that the Commission carefully weighed the record in the case and found that there was "much expert evidence produced" to justify the prudence and feasibility of the project and that "no contrary testimony was offered." Id. at 436. The Wilcox Court stated, "It is the function of the Commission to use its expertise in the evaluation of such expert testimony and we cannot say that the Commission has failed in such appraisal." Id. at 437.

ELPC/Vote state that Gernand, also cited by ComEd, is much the same. Gernand involved a water utility's petition seeking a certificate of convenience and necessity to conduct "test-boring surveys" to find groundwater in rural Vermillion County. Just as in Wilcox, the court in Gernand did not relax the utility's burden of proof, or excuse the utility from justifying its proposal. Instead, the court found that the utility presented a "substantial amount of evidence" in support of the project that "clearly met" its burden of proof. Gernand, 286 Ill. App. 3d at 936, 944.

ComEd also cites the Commission's prior approval of ComEd's AMI pilot in Docket No. 09-0263 as evidence of the Commission's "long-history of approving innovative technology pilots." ELPC/Vote specify that the Commission's careful scrutiny of the costs and benefits of each element of ComEd's AMI pilot is exactly what the Commission should do in the instant case. The Commission did not approve every element of ComEd's AMI

proposal. Instead, it looked carefully at the evidence to determine whether ComEd met its statutory burden to prove that project expenditures would be prudent and valuable to ratepayers as a whole. ELPC/Vote add that the Commission decided to approve some of ComEd's proposal, but rejected other parts, including ComEd's request to recover costs for 10,000 AMI meters that the Company had awarded to the City of Elgin through a community energy challenge program. The Commission agreed with Staff that ComEd failed to produce persuasive evidence that the Elgin project would produce useful information that would benefit ratepayers as a whole. The Commission rejected the costs, finding that:

> We cannot and will not impose the cost of a program upon all ratepayers when, as is the case here, only a small minority of a utility's territory, Elgin residents, will benefit from that program, while the rest of ComEd's ratepaying consumers will gain no benefit from the Elgin project.

Commonwealth Edison Co., Docket No. 09-0263, Order at 19 (Oct. 14, 2009). The Commission observed that the record was "scant" as to the benefits of the Elgin program and concluded by "remind[ing] all utilities that Commission approval is essential before any cost will be imposed on ratepayers." Id. at 19. The Commission examined the AMI pilot exactly as ELPC/Vote propose that it examine the microgrid pilot here.

ELPC/Vote argue that essentially, the CUB/EDF agreement with ComEd has it backwards. The CUB/EDF agreement requires ComEd to do it right next time, and that violates fundamental regulatory principles that require ComEd to do it right this time and, in fact, every time. If ComEd's Project was in fact prudent, the CUB/EDF—ComEd agreement would not need to address so many flaws.

ELPC/Vote submit the evidentiary record in this case does not support a finding that Phase II of ComEd's project is prudent. All parties agree that ComEd's concessions on rebuttal have improved the overall project, but these concessions did not alter Phase II in any material respect. ComEd still intends to construct a large, expensive, utility-owned microgrid that is heavily dependent on fossil fuels in a location that already has highly reliable service. ELPC/Vote reason that is why all of the microgrid experts in this case continued to oppose approval of Phase II despite the "promising changes" that will improve Phase I. ELPC/Vote Ex. 2.0 at 2; CUB/EDF Ex. 2.0 at 2; AG Ex. 2.0 at 7; Staff Ex. 4.0 at 4. In particular, CUB/EDF witness Barbeau continued to recommend that the Commission "defer approval of Phase II" unless and until the Company works with stakeholders to significantly improve the proposal. CUB/EDF Ex. 2.0 at 3.

ELPC/Vote state that ComEd's commitment to take future steps to develop a different pilot program for third-party microgrids does not change the scope or substance of the proposal on the table for the Commission's review in this case. In fact, the Illinois Supreme Court has rejected similar "settlements" of Commission cases in the past, emphasizing that Commission orders must be based "exclusively on the record" developed in the case. Bus. & Prof'l People for Pub. Interest v. Ill. Commerce Comm'n, 136 Ill. 2d 192, 212 (Ill. 1989) ("BPI I"). In BPI I, the Supreme Court considered an appeal of a Commission decision granting ComEd a two-step rate increase to cover costs associated with bringing certain nuclear power plants into service. The Commission's

challenged order was based on an agreement negotiated between ComEd and Staff, rather than on the evidentiary record developed in the case. The Supreme Court reversed the Commission's order, finding that the Commission acted outside of its statutory authority by basing its order on an agreement between the parties that lacked an evidentiary foundation in the record. The Court emphasized that "[t]he Commission only has those powers given it by the legislature through the Act," one of which is the requirement that "any finding, decision or order made by the Commission shall be based exclusively on the record for decision in the case." BPI I, 136 Ill. 2d at 201. ELPC/Vote concludes that the Commission must make a decision about whether Phase II of the Project is prudent based on the record in this case. Future steps taken by ComEd to facilitate competitive microgrids have no bearing on whether the record in this case supports the prudence of Phase II of the Project.

5. Commission Analysis and Conclusion

All parties agree that the prudency standard as described in Illinois Power applies in this case, which is the "standard of care which a reasonable person would be expected to exercise under the same circumstances encountered by utility management at the time decisions had to be made." Illinois Power at 201. The Commission agrees with ComEd that experienced utility managers can and do regularly make decisions, especially with respect to questions such as the value of future learnings, in the face of uncertainty and based on judgment. What is at issue is whether the costs of the Project are outweighed by its benefits. The Company's Project consists of two Phases of which the Commission will consider both in its prudence/reasonableness analysis.

The Commission disagrees that Ill. Power Co. requires a quantitative analysis of costs and benefits, as Staff, ELPC/Vote and the AG argue. In Ill. Power Co., the utility argued that the Commission erred in finding a propane plant's retirement imprudent because the utility did not conduct a detailed present value of revenue requirements analysis, which is a quantitative analysis. The court found that the Commission wrongly required this analysis, thereby ignoring other pertinent evidence the utility proffered about its decision, including another economic analysis which considered safety and reliability concerns. Here, Staff and the AG state that ComEd only provides evidence of "learnings" which they claim are too vague and insufficient to be considered as benefits. Staff argues that ComEd has not clearly stated what it hopes to learn. On the contrary, ComEd has provided significant record evidence that the Project will increase the reliability and resiliency of the Bronzeville grid. Like in Illinois Power Co., ComEd's benefit analysis focuses on safety and reliability concerns which cannot be easily quantified, but are of the utmost importance to the utility and its customers. The Commission agrees with ComEd that DER interconnections with the grid are growing, and increasing penetration of DER requires ComEd to plan, design, and operate its system in new and innovative ways to manage decentralized, multi-directional power flows. The Commission also finds that the record demonstrates that microgrids can provide increased resiliency and are capable of mitigating the impacts of cyber and physical attacks or weather events. The Commission acknowledges that the learnings of this Project impact all of ComEd's 3.9 million customers.

The AG argues that because ComEd states they will not have cost and benefit information until 2020, the Project is not prudent. The AG is incorrect that ComEd must show prudency before undertaking a project as Ill. Power Co. specifically states that prudency is a determination based on the information the utility has at the time it makes a decision. The Commission also agrees with ComEd that utilities are often required to conduct projects without a detailed quantitative cost/benefit analysis. Specifically, ComEd mentions safety projects and diversity and minority outreach. The Commission also points to other recent directives such as those findings in Docket No. 11-0721, where the Commission required ComEd to perform certain rate design studies in response to an intervenor's concerns, without consideration of either costs or benefits. Commonwealth Edison Co., Docket No. 10-0467, Order at 191 (May 24, 2011).

Ill. Power Co. also states that the Commission cannot force a utility to make decisions which are consistent with similar situations in the past. Ill. Power Co. at 435. ELPC/Vote argue that the Commission should analyze the Project similarly to how it analyzed ComEd's AMI pilot program. The Commission is not required to direct ComEd to conduct the microgrid pilot like it conducted the Elgin AMI pilot.

The Commission declines to merely adopt Phase I because it does not include clustering and would incorporate far fewer customers and critical customers thus not producing learnings or benefits of the same value that both Phases will produce. For this reason, the Commission rejects ELPC/Vote's recommendation to defer a determination on Phase II until Phase I is complete. The Commission points out that Staff acknowledges that the benefits of clustering are not met if the Project is terminated with Phase I.

The Commission declines to adopt Staff's proposal that a modified Phase I be approved, which would connect Phase I to the existing IIT microgrid. Staff proposes a modified Phase I that covers the area footprint of Phase I and includes an interconnection with the IIT microgrid along with adequate permanent controllable DER to supply the full 2.5 MW of load that exists therein. The Commission agrees with ComEd that Staff's alternative proposal does not meet the technical characteristics (e.g., sensors and topology) of ComEd's proposal and does not include all of the CPD headquarters, one of the most critical public service facilities in the City of Chicago. As all parties have repeatedly stated, microgrids must incorporate a diversity of customers, load profiles, and power flows. Staff's "modified" Phase I limits the opportunities for installing, operating, and studying control and measurement devices and noticeably limits the learnings and resiliency benefits available from the Project. If Staff's modified Phase I is augmented to remedy these issues, the cost of the modified Phase I approaches the cost of the full Phase II that ComEd proposed. The Commission agrees with ComEd, and case law supports, that the Commission should disregard alternatives that do not achieve the stated goals of the Project.

The Commission agrees with Staff that ComEd should be required to file certifications demonstrating that Phase I of the Project is successful prior to any authorized expansion, and ComEd agrees. Staff and the Company also agreed that any such pre-approval of expansion should expire within a reasonable timeframe; the Commission supports their jointly proposed date of December 31, 2021.

The Commission therefore adopts ComEd's proposal for Phase I and II. The Commission encourages the kind of innovative pilots such as the Project which have the ability to inform myriad stakeholders about DER and the use of grids. The Commission notes that DOE has indicated its interest in promoting microgrid studies, as demonstrated by the grants it is offering. Pilot programs, such as the Project, are appropriate ways to test new technologies because of the smaller-scale, lower-cost abilities of a distinct sample size, which has wide-reaching application both in Illinois and across the country. Further, the Commission agrees with ComEd that pilots and demonstration projects help stakeholders and regulators learn whether larger-scale, more-permanent or longer-term deployments might be worthwhile and, if so, to learn more about how to take those steps.

B. Any Other Applicable Standards

1. ComEd's Position

ComEd states that the prudence and reasonableness standards are the relevant standards upon which to analyze this Project. ComEd asserts that the Commission should reject what the AG characterizes as other legal standards that might apply to the Project. ComEd contends that none of the standards to which the AG points are relevant, and some are not standards for a utility technology project action at all. ComEd maintains that none of them require a finding that the Project is not prudent and reasonable.

ComEd asserts that there is no merit to the AG's argument that the Project violates Section 9-241 of the Act because they assert it will provide superior service to a small number of ComEd customers. ComEd maintains that, as a demonstration, the Project does not represent an unreasonable difference in service between groups of customers.

ComEd states Section 9-241 prohibits utilities from "mak[ing] or grant[ing] any preference or advantage to any corporation or person," and from "establish[ing] or maintain[ing] any unreasonable difference as to … services, facilities, or in any other respect, either as between localities or as between classes of service." 220 ILCS 5/9-241. Section 9-241 does not require that all customers receive identical service, only that there are no unjust differences in service. Citizens Util. Co. v. Ill. Commerce Comm'n, 50 Ill. 2d 35 (1971). ComEd argues different classes of customers receive different service, and different customers always receive service through different equipment (and different types of equipment) based on utilities bona fide engineering and planning standards and/or as new technology is being deployed and tested. ComEd states the Commission need only consider the recent effort to deploy AMI meters to understand that new technologies are first tested and then, over time, deployed.

ComEd maintains it is not unjustly or unreasonably discriminatory to demonstrate, or pilot, technologies. On the contrary, ComEd asserts it is prudent and reasonable to demonstrate and study new technologies so that they can be used appropriately in the future. ComEd contends the AG's argument would require that new technologies be either applied immediately everywhere on the system, or nowhere at all. ComEd finds that the AG's position is unreasonable.

ComEd states that the AG's related argument that the Project represents a non-standard service similarly lacks merit. ComEd states the AG seeks to misapply an irrelevant standard. ComEd maintains the Project is not a non-standard service. ComEd

explains that the distinction between standard and non-standard service prevents customers from requesting or demanding service above and beyond what ComEd would otherwise install and consequently impose the cost of that service on other customers. For this reason, ComEd states its tariffs regarding non-standard service are predicated on customer requests or requirements. However, ComEd explains, the existence of those tariffs does not limit ComEd's ability to prudently and reasonably design its system to serve its customers. The components of ComEd's distribution system differ in different areas of the system, depending on the needs of the system. For example, ComEd states undergrounding is common within the City of Chicago, but less common outside it. Although the infrastructure that serves customers in the city differs from the infrastructure serving customers outside it, ComEd explains neither is considered non-standard service because the design is a matter of ComEd's reasonable assessment of grid needs, rather than the preferences of any individual customer.

Here, ComEd states it has proposed to undertake the Project to develop learnings that will be useful across its system; ComEd has not proposed to undertake the Project because any customer or group of customers requested that it do so. ComEd states the Project represents an opportunity to improve service across the ComEd system; it is not an instance of certain customers imposing the cost of their unique needs on other customers.

ComEd also states there is no merit to the AG's argument that letters from members of the community, attached to ComEd's Petition, indicating support for the Project, are somehow akin to customer requests for non-standard service. First, ComEd states the letters are obviously not the impetus for the Project, as shown by their dates. Second, ComEd explains, the fact that key stakeholders and officials are interested in a demonstration of new and innovative technologies does not render the Project non-standard service, nor render their expressions of interest a request for non-standard service. ComEd maintains the existence of interest among the public in microgrid technology will not, as the AG asserts, put both the Commission and ComEd in the difficult position of picking and choosing who does and who does not benefit from microgrids in the future. On the contrary, ComEd states that if it receives a request for a non-standard microgrid in the future – that is, a microgrid that ComEd would not have chosen to install as part of its own efforts to maintain and improve the grid based on sound engineering judgement – then, tariffs are in place to ensure that customers who benefit from such service bear the cost.

ComEd continues that the Commission should reject the AG's argument that the Project is not used and useful because it will rarely if ever be used in island mode. ComEd states that the AG implies that islanding will occur only in the event of a major grid disturbance, and that the Project will be "used" or "needed" only when it is islanded for that reason. ComEd asserts the AG misconstrues the legal standard, and misrepresents the record. ComEd contends the question of whether an asset is used and useful is separate from the question of whether investment in the asset is prudent. ComEd states it has requested a finding that pursuing the Project is prudent and reasonable, but has not requested a used and useful determination. ComEd explains used and useful determinations should be made in individual annual formula rate updates, as the Project assets are placed in service and the costs in rates. ComEd contends it is not especially

enlightening to consider the question of whether assets are, or will be, used and useful before the assets are even under construction. That being said, ComEd states the assets will obviously be used and useful; since customers will be taking distribution service from them and supplying those services through a microgrid, it is both useful to the customers supplied and to customers generally. ComEd asserts the frequency with which the microgrid islanding feature is used has nothing to do with those facts.

ComEd states that, in focusing on whether the Project will be used in the event of a grid disturbance, the AG also ignores other primary purposes for the Project, such as its use to develop learnings about the integration of DER onto the grid, the management of related bi-directional power flows, and the interconnection and interoperation of two clustered microgrids. ComEd explains the data to develop these learnings will be available whether the Project is operating as an island or not. Because the Project will be constantly generating data to inform these learnings, ComEd contends the Project will be consistently used and useful throughout its service life.

ComEd states that the Commission should also reject the AG's argument that the request to recover the cost of the Project from all customers violates the legislative guidance at Section 1-102 of the Act, which states that costs of public utility service should be allocated to the customers that cause those costs. ComEd maintains the purpose of the Project is to generate learnings that will inform system design in the future. Because efficient and effective system design will benefit all customers, ComEd explains there are no "cost-causing" customers to which the costs of the Project should be allocated. Rather, ComEd asserts it is appropriate to recover the costs of the Project from all customers.

Finally, ComEd asserts that the Commission should reject the AG's argument that ComEd's proposal violates the Section 8-401 requirement that public utilities "shall provide service and facilities which are in all respects adequate, efficient, reliable, and environmentally safe and which, consistent with these obligations, constitute the least-cost means of meeting the utility's service obligations." 220 ILCS 5/8-401. ComEd contends the record in this proceeding demonstrates that the Project will produce significant benefits, primarily in the form of learnings that will enable ComEd to design and operate its distribution system to provide "adequate, efficient, reliable, and environmentally safe" service to customers, in the face of a surge in installations of DER and a corresponding rapid increase in bi-directional and fluctuating power flows. In other words, ComEd states, a primary purpose of the Project is to inform ComEd about effective and efficient ways to design and operate the distribution system. ComEd maintains the learnings from the Project will enable efficient, reliable service at the least cost in the future. Therefore, ComEd states, the Project does not violate Section 8-401.

2. AG's Position

a. The Project Violates Section 9-241 Of The PUA

The AG claims other sections of the PUA are relevant to the Commission's decision whether to find the Project to be reasonable and recoverable as a delivery service. The AG notes that the Project is designed to provide superior service to a small number of ComEd customers and concluded that this preferential treatment violates Section 9-241 of the Act which provides:

> No public utility shall, as to rates or other charges, services, facilities or in other respect, make or grant any preference or advantage to any corporation or person or subject any corporation or person to any prejudice or disadvantage. No public utility shall establish or maintain any unreasonable difference as to rates or other charges, services, facilities, or in any other respect, either as between localities or as between classes of service.

220 ILCS 5/9-241. The AG maintains that ComEd's Project violates Section 9-241 in that it makes or grants a "preference" with respect to "services" and "facilities" to the residents, businesses, and other ComEd customers within the Bronzeville microgrid footprint as compared to all other ComEd customers and as compared to all other locations in ComEd's service area. For example, ComEd witness Svachula explained that "[a] microgrid can operate both when connected to the larger electric grid and continue to operate as an 'island' when there is an interruption or other grid disturbance, improving statistical reliability and strengthening grid security and resiliency." Mr. Svachula added that microgrids can provide reliability, security, and resiliency to customers that is simply not practical or feasible with other conventional distribution system technologies. The AG asserts that this demonstrates that the microgrid area would provide enhanced facilities and services to the 1,060 customers within the Project's footprint. As an example, the AG suggests that if there was a cascading transmission event causing the town of Streator to "lose[] its connection to the broader regional grid," there is no microgrid that would "operate as an 'island'" and use DER to "keep electricity flowing to [the affected] area." The same is true for the rest of ComEd's service area.

The AG notes that Section 9-241 reflects the fundamental regulatory principle that all customers are to be treated fairly and equivalently and that ComEd's tariffs are consistent with this principle. ComEd's Rider NS – Nonstandard services and facilities, requires customers who request nonstandard service to pay ComEd's costs for providing the non-standard service. ComEd Tariff Sheets, Ill. C. C. No. 10, Original Sheet 277; Tr. at 117–118. Similarly, ComEd's Rider LGC – Local Government Compliance Adjustment provides that if a local government unit exercises its constitutional or statutory authority to require ComEd to provide non-standard service, then the residents of the local government unit are required to pay for the costs of providing such non-standard service. ComEd Tariff Sheets, Ill. C. C. No. 10, 3rd Revised Sheet 253.

The AG points out that the dangers associated with providing non-standard or superior service to some customers or locations are illustrated by some of the letters included in the Appendix to ComEd's Amended Petition. Amended Petition Appendix I contains letters from either customers within the microgrid area who support ComEd's expenditure of $25 million in their neighborhood or customers who would like to receive superior, non-standard service from ComEd at no additional cost. For example, the Chicago Rockford International Airport noted that the project may benefit it someday, and suggested that it too would benefit from "keeping the power on at critical infrastructure facilities like the Chicago Rockford International Airport." These letters represent parties that stand to benefit from ComEd offering non-standard service, but with the cost covered by all of ComEd's 3.9 million customers.

The AG cautions that if non-standard service is offered by the utility, at costs that are heavily-subsidized by customers who do not benefit from the non-standard service, both ComEd and the Commission can expect that requests for non-standard service will multiply, putting both the Commission and ComEd in the difficult position of picking and choosing who benefits and who does not. The AG concludes that the wisdom of the discrimination prohibition and the non-standard service riders is highlighted by the dangers presented by allowing discretion to bestow non-standard service.

The AG relies on the testimony of AG witness Dr. Selwyn that in the telecommunications sector, that had previously been a monopoly service subject to the same non-discrimination requirements (including Section 9-241), when customers want a higher standard of service or reliability, it is common for them to contract for and pay the additional cost for a higher level of reliability or service. In the electricity sector, the private sector today provides microgrids or heightened reliability, or as IIT suggests, "perfect power" as an alternative to standard ComEd service. The AG is concerned that if ComEd desires to compete with private providers of superior reliability and service by offering non-standard service, the Commission should require that it be provided as a non-regulated service that is not included in the utility's delivery service revenue requirement.

In addition to not being a reasonable expenditure of ratepayer money in light of the lack of evidence of benefits, the AG concludes that the Project contravenes the explicit non-discrimination prohibition in Section 9-241 in that it grants customers within the Bronzeville microgrid footprint a locational preference and non-standard service that is superior to the services and facilities provided to all other customers in ComEd's service area. The AG asserts that a microgrid by definition provides superior service, and ComEd's Petition should be rejected for this reason as well.

b. The Project Is Not Used And Useful

The AG asserts that ComEd's proposed microgrid cannot be approved and included in formula rates because it violates the principle that utility plant must be used and useful to be included in rates. Section 9-212 of the Act states, in relevant part:

> No new electric utility generating plant or gas production facility, or significant addition to existing facilities or plant, shall be included in a utility's rate base unless and until the utility proves, and the Commission determines, that such plant or facility is both prudent and used and useful in providing utility service to the utility's customers.

220 ILCS 5/9-212. The AG notes that while ComEd explained that the virtue of microgrids is that they can be "islanded," and project DER will operate to keep power flowing to customers, the record evidence shows that the Project would rarely if ever be used in island mode. ComEd was not able to identify any past outage that would have led to islanding, and Staff witness Mr. Rockrohr stated that all interruptions in the last five years in the area were due to problems involving the distribution facilities themselves, would not have resulted in islanding and the use of DER. The AG maintains that the Commission cannot include $14.7 million in rate base for DER that may never be used for islanded

purposes because it cannot find that such plant is “used and useful” under Section 9-212 of the Act.

c. The PUA Is Based On Costs Being Traced To Cost Causers

The AG cites the findings and goals the General Assembly, including that “the cost of supplying public utility services is allocated to those who cause the costs to be incurred.” 220 ILCS 5/1-102(d)(iii). The AG claims that ComEd’s request to recover the cost of the Project from all ComEd customers violates this maxim and that ComEd’s suggestion that all customers should pay for the Project because they will benefit from the so-called “learnings” the Project would generate should be rejected as illusory. The AG notes that the Commission should review ComEd’s request for a prudence and reasonableness finding by considering the cost of the Project as if the 1,060 cost causers and beneficiaries were solely responsible for the cost. The AG relies on the testimony of Dr. Selwyn, who showed that if the cost were allocated to the 1,060 customers who are project beneficiaries, the cost to them would be $388 per month, which is clearly excessive and unacceptable. The AG asserts that when the cost of the Project is matched to the customers who would benefit, it shows the true cost and demonstrates that it would be inconceivable that ComEd could identify benefits to meet or exceed this cost.

d. The Project Contravenes The Act’s Requirement That Utilities Provide Least-Cost Service

The AG cites Section 8-401 of the Act for the principle that utilities must provide service that is least cost. Section 8-401 states:

> Every public utility subject to this Act shall provide service and facilities which are in all respects adequate, efficient, reliable and environmentally safe and which, consistent with these obligations, constitute the least-cost means of meeting the utility's service obligations.

220 ILCS 5/8-401. The AG maintains that ComEd’s project is a very expensive approach to reliability and resilience and violates the least-cost requirement included in Section 8-401.

The AG refers to the fact that ComEd is in the midst of extensive modernization of its distribution system, spending $1.3 billion since 2012, and on track to spend an additional $1.3 billion by 2022. 220 ILCS 5/16-108.5(b)(1)(B). The goals of that modernization plan include underground residential cable and mainline cable system replacement and repair, storm hardening, distribution automation, and cyber-secure communications. 220 ILCS 5/16-108.5(b)(1). This spending is specifically authorized by the General Assembly and addresses the same objectives as the Project. Indeed, the General Assembly’s interest in service improvements was codified in the required reliability improvement metrics adopted when it approved the massive spending requested by ComEd in 2011. 220 ILCS 5/16-108.5(f). The Project estimates $11.3 million in distribution infrastructure and $14.7 million in DER.

The AG asserts that the key difference between the Project and the distribution investments authorized by the General Assembly is that the latter spending improves

reliability and resilience throughout the distribution grid without the need to locate new energy resources, paid for by the public and utilized only in the most extreme circumstances to serve a very small subset of customers. The AG notes that ComEd provided no analysis of the cost or feasibility of any alternative or less costly methods to achieve its goals. The AG concludes that a project that provides reliability and resiliency at double the cost of distribution infrastructure modernization and duplicates existing energy resources is not least-cost.

3. Staff's Position

Staff asserts that the applicable standard for whether the Project is prudent should be determined through an evaluation by the Commission of whether the projected benefits of the Project are greater than its projected costs.

4. Commission Analysis and Conclusion

The Commission finds that the applicable standard upon which to analyze the Project is the general prudency standard detailed in Section 9-211 of the Act. The AG states that notwithstanding that Section, the Project violates several other applicable standards in the Act, specifically: (1) Section 9-241 requiring a utility treat all customers equally; (2) the requirement that an investment be both used and useful pursuant to Section 9-212; (3) Section 1-102's requirement that costs are borne by the cost-causers; and (4) least cost service be provided to ratepayers as required by Section 8-104. The Commission finds that none of these standards are violated by the Project. The Commission agrees with ComEd that Section 9-241 does not provide superior service to only one small portion of ComEd's ratepayers. Moreover, the statute does not require identical service for all customers, merely fair service. The microgrid would not give customers substantially improved service, as the AG argues.

The Commission agrees with ComEd that a Section 9-212 determination of used and useful should be made in the annual formula rate updates, when Project assets are placed in service and the costs in rates. The Commission further agrees with ComEd that the Project does not violate Section 1-102 because the learnings from an efficient and effective system design will benefit all customers. There are no "cost-causing" customers to which the costs of the Project should be allocated.

Finally, the Commission agrees that the Project does not contravene Section 8-104 because the Company plans to operate its distribution system to provide "adequate, efficient, reliable, and environmentally safe" service to customers, in the face of a surge in installations of DER and a corresponding rapid increase in bi-directional and fluctuating power flows. The primary purpose of the Project is to inform ComEd about effective and efficient ways to design and operate the distribution system. The Commission agrees with ComEd that the learnings from the Project will enable efficient, reliable service at the least cost in the future.

C. Purpose/Benefits of the Project

1. ComEd's Position

ComEd explains that the Project is a demonstration and study designed to generate learnings, via real-world experience, that can be used to evaluate the design and performance of microgrids and the larger grid. ComEd states the Project will deploy cutting-edge technology to cluster a private, third-party-owned, behind-the-meter microgrid with a microgrid layered on the utility distribution grid. ComEd plans to study the Project over a period of approximately ten years, and will track and measure the costs and benefits of the Project to generate learnings that will benefit the Commission, customers, system operators, and the public generally.

ComEd states that the Project will result in learnings which will allow ComEd, the DOE, the Commission, and others to assess how microgrid technologies work and study approaches to deploying them in the real world. ComEd contends that these learnings will be particularly valuable because the portion of the Project that layers a microgrid onto an existing urban utility distribution grid is unique in the industry, as is the clustering of such an urban community microgrid with a behind-the-meter microgrid. ComEd explains these features of the Project will enable learnings regarding best-practices in overlaying microgrids on existing utility systems, in connecting and co-operating third-party-owned microgrids with the utility distribution system, and allow ComEd to learn about how microgrids can impact reliability and resiliency generally, rather than address a specific challenge. ComEd states the overlay of the Project on the utility system will also enable learnings regarding best-practices in incorporating DER into the distribution system.

ComEd finds these learnings will enable ComEd to more effectively design the larger distribution grid, respond to increasing penetrations of DER, and anticipate the possibility that microgrids will become more widespread. ComEd argues that certain learnings expected to be gained through the Project, regarding coordination of grid operations, resource diversity, and overall grid benefits, can only be fully explored through actual operation of a microgrid and real world interactions with a range of customers and energy resources.

Beyond the learnings gained by the Project, ComEd argues that the Project will also have a direct and positive impact on the public safety through added security, increased resiliency, including in response to extreme weather events and cyber or terrorist threats, and enhanced overall reliability. ComEd explains that the Project will provide service to critical facilities that play a role in emergency response, in particular the Public Safety Headquarters of the City of Chicago, which houses the CPD, and will provide added stability to these facilities and those who depend on them. ComEd states that islanding also allows the Bronzeville neighborhood to function as an electric island in the event of a larger disruption or natural disaster. In addition, ComEd explains, the Project will enable learnings regarding sectionalizing the grid into smaller modular segments, which can isolate a cyber or physical attack, and utilization of "black start" capabilities to bring assets back online after a disruption, and other learnings that will support cyber and physical threat mitigation efforts throughout the ComEd system.

ComEd contends that the Project will benefit all ComEd customers. The learnings acquired during the process of designing and operating the Project will enable ComEd to more effectively design the larger distribution grid, to support the possibility for widespread implementation of microgrid capabilities, and to respond to increasing penetrations of DER. ComEd argues that the benefits of the Project are not limited to the customers within the Project footprint and those it directly affects, but that the benefits derived from the learnings gained through the project will benefit every customer that takes electric delivery service in an increasingly complicated distribution-system environment. Additionally, the resilience benefits associated with the microgrid will support the wider area, both through the services provided by customers like the CPD, but also by the constitution of an oasis which will continue to function during emergencies. ComEd notes it has committed to provide reports to stakeholders, and states that the reporting, and its partnership with the DOE, will support the dissemination of the results and learnings from the Project.

ComEd notes the AG dismisses the value of the learnings of the Project to ComEd's customers, stating that ComEd has no current plans to develop additional microgrids, and arguing that ComEd consumers should not pay for learnings that will be of no use to them or pay for a project the learnings of which will benefit private parties, who do sell and develop microgrids. ComEd states the AG takes the position that the Project will benefit only those customers within the Project area, and any additional customers who are able to reach the area in the event of a grid disturbance. ComEd contends the record supports a contrary conclusion: the Project learnings will be of value in designing and operating the distribution system to accommodate increasing penetration of DER, interconnecting and operating microgrids (utility or third-party-owned), and understanding the impacts of increased resiliency. ComEd maintains these learnings will enable ComEd to effectively design the system for the benefit of all its customers, whether those customers are directly served by a microgrid or not.

ComEd asserts that ELPC/Vote's suggestion that the Project should incorporate more renewable DER appears to ignore that it plans to procure distribution services provided by third-party-owned non-storage DER through a competitive procurement process. Because the procurement process for Phase II has not yet begun, ComEd states it cannot anticipate what types of non-storage DER will ultimately be installed in the Project. As part of that procurement process, ComEd states it plans to consider factors including: (i) capability and reliability; (ii) capital and operating costs; (iii) environmental attributes; and (iv) engineering standards and requirements. ComEd explains the permanent DER installed in Phase II must be controllable – they must be capable of supplying the entire load of the Project area in an islanding event, the timing of which may not align with solar PV generation. ComEd notes parties have stated that solar PV can become controllable by being paired with battery storage. While that may be true, ComEd anticipates that obtaining sufficient solar PV and battery storage to supply the entire Project area will be significantly more expensive than other DER options. As a result, ComEd states it expressly requested that the Commission provide guidance, in its Order in this proceeding, regarding the balance between emphasis on renewable DER and cost, so that the competitive non-storage DER procurement process can strike that balance. With the Commission's guidance on this issue, ComEd maintains the Project will incorporate renewable DER in a prudent proportion.

ComEd also notes that the AG and ELPC/Vote's reference to an order issued by the Maryland Public Service Commission ("Maryland PSC") should not be given weight because the Maryland Order has no bearing on this case. ComEd explains there is no evidence in the record regarding the nature or details of the microgrid proposal presented to the Maryland PSC and no indication that the evidence upon which the Maryland Commission relied is applicable to the proposal before this Commission. ComEd argues that the PUA requires the Commission to rule on ComEd's Petition based on the evidence in the record in this docket, not in a year-old proceeding in Maryland. In fact, ComEd states, ELPC/Vote's discussion of the proposal presented to the Maryland PSC reveals key differences, which render the Maryland Order inapposite. For example, ComEd notes that the proposals presented in Maryland utilized only natural gas and diesel DER, while ComEd's proposal here utilizes solar PV and battery storage. ComEd also notes that the Maryland PSC rejected the proposal because it did "not include any tangible metrics by which performance, let alone success of the project, may be evaluated." In The Matter Of The Baltimore Gas And Electric Company's Request For Approval Of Its Public Purpose Microgrid Proposal, Case No. 9416, Order No. 87669 at 17 (July 19, 2016).. ComEd states it has presented an extensive catalog of metrics that will be used to evaluate and report to the Commission regarding the impacts and benefits of the Project.

2. AG's Position

The AG notes that ComEd plans to study the Project over a period of approximately ten years, and will track and measure the costs and benefits of the Project to generate learnings that will benefit the Commission, customers, system operators, and the public generally, and that the primary objective of the Project is to gain "learnings" about the next wave of distribution system design.

AG witness Dr. Selwyn determined that the reliability and resiliency benefits of the Project would inure almost exclusively to the 1,060 customers in the Project's footprint. Any benefits realized by customers outside the Bronzeville area would be ancillary. Dr. Selwyn further explained that the "so-called 'indirect' benefits are vague at best, and to the extent that any exist at all, are minuscule in comparison with the direct benefits in terms of resiliency and reliability that would be offered to those few customers actually connected to the microgrid." Dr. Selwyn noted that the only indirect benefits ComEd identified are that "people in neighboring areas may be able to reach the microgrid area to partake of its advantages in a major, regional outage."

In response to ComEd's assertion that the primary purpose and justification of the Project are to generate "learnings," the AG reviews the design of the Project to assess whether the Commission could expect the Project to provide the "learnings" ComEd promised. The AG states that several of the areas of study are ongoing utility obligations, such as grid security and reliability, distributed energy resource integration, emerging operation, and coordination. These are areas that the utility is already addressing as part of its statutory obligations, which expressly include distribution infrastructure improvements, storm hardening, cyber-secure data communications, distribution automation, and integration of distributed energy resources. 220 ILCS 5/16-108.5(b)(1); 220 ILCS 5/16-107.5 (distributed energy resource integration, net metering, and smart inverters). The AG asserts that it is unreasonable to suggest that ComEd cannot estimate

or predict the benefits associated with the Project until it is complete when these are areas that are: (1) well within the utility's current service and investment obligations; and (2) already the subject of a statutory spending mandate.

Notwithstanding ComEd's claim that it cannot quantify the benefits or "learnings" of the Project until it is authorized and completed, one initial "learning" that is available today is how much ComEd expects the microgrid to cost. As discussed in the "Cost of the Project" section below in IV. D., the $25 million cost of the Project sets the bar for the level of benefits that must be produced. The AG notes that while ComEd claims this is a "modest cost," it is equally true that the benefits must match or exceed $25 million for the Project to be considered prudent. The AG asserts that if the Commission uses ComEd's approach, there is no real limit on expenditures for small groups of customers because high unit costs are by definition diluted when spread over millions of customers.

The significance of the per-customer cost grows when one considers ComEd's position that the Project is testing utility-scale microgrids that can be layered onto the existing distribution system. A key factor in assessing the prudence of a project that can be expanded across the grid is whether it is reasonable to spend $14.9 million in distribution and engineering costs and another $14.7 million for generation to provide enhanced service to 1,060 customers. The AG states that a key "learning" already known is that the high per-customer cost of utility-scale microgrids like the one proposed in this docket prohibits them from being layered across the ComEd distribution system, and that no benefits that can approach that cost have been identified.

The AG maintains that a dispassionate look at the claimed benefits and the project design calls into question whether the Project is "tailored to achieve its goals." One goal that the Project is designed to achieve is to "cluster" or connect to the IIT microgrid. The AG notes that the IIT microgrid is the only microgrid of which ComEd witnesses Svachula and Bahramirad were aware, limiting ComEd's options to this one location. The AG adds that clustering with IIT may not be fully operational in Phase I, and the one essential public service, the CPD Headquarters, will not be fully served until the completion of the more expensive Phase II of the Project, calling into questions the available "learnings" if the project is limited to Phase I.

The AG responds to ComEd's assertion that another key learning of the Project is providing power to public service functions or serving "the public good." The AG points out that the only public institutions served by the Project are a local public library, one public high school, and the CPD Headquarters, which already has back-up power. The other customers ComEd identifies as "critical public service" are private institutions that are ordinarily expected to pay for non-standard service if they require or desire it.

In response to ComEd's view that another benefit is that "customers in neighboring communities would also benefit from the availability of critical services and business in the islanded microgrid area," the AG quotes the Maryland PSC that addressed this identical argument last year when reviewing Baltimore Gas and Electric Company's "request for approval to construct, operate and recover costs associated with two 'public purpose' microgrids." Baltimore Gas And Electric Co., Case No. 9416, Order No. 87669 at 1. In denying Baltimore Gas and Electric Company's request without prejudice, the Maryland Commission said: "As filed, the Proposal is deficient in several key aspects

which preclude us from finding that the project, despite its stated benefits, would provide adequate, reasonable, and proper electricity service in Maryland." Id. at 7. The Maryland PSC rejected the notion a microgrid will benefit neighboring communities because: (1) there was no evidence that other communities could reach the microgrid area in an extreme outage situation; (2) there was no evidence that critical commercial facilities within each microgrid location would have sufficient capacity to meet regional needs; (3) a "major event" triggering microgrid islanding was never defined; and (4) no plan was presented to keep the microgrid area "fueled, maintained and operational, while presumably restoring service to all its customers with due alacrity." Id. at 9-10. The AG asserts that the same unanswered questions loom in this docket.

The AG maintains that ComEd did not present evidence that commercial or public facilities are willing or have the ability to accommodate neighboring communities in case of a major outage and that the project does not include a major grocery store (Jewel), a Walgreens drug store, or an LA Fitness health club, all literally across the street from the microgrid. The AG points out that it will be difficult if not impossible to "learn" how neighboring communities will benefit from a utility-scale microgrid or how local businesses will accommodate neighboring communities in a widespread outage if the Project does not include even such basic resources as a grocery store, a major pharmacy and health products store, and sanitation services.

Accepting ComEd's assertion that the Commission should rely on the "learnings" from the project to create system-wide benefits, the AG states that a review of the evidence demonstrates that in fact the project captures only a small portion of benefits to be tested. There is no communications, transportation, water, or wastewater infrastructure in the area; there are no major hospitals despite the fact that Chicago is home to several major health care institutions; there is only one public safety institution (CPD) that can be considered "mission-critical," but it already has back-up generation and is only partially served in Phase I; there are no firefighting facilities; no major grocery or other businesses were identified; there are no City social service agencies in the area and no evidence that public safety or social service agencies could "set up and work in the microgrid neighborhood." The AG notes that the value of "learnings" depends on a project that can capture the various functions and potential benefits claimed for the project, but that unfortunately the project design will severely limit learnings that can come from protecting electric service to critical public health and safety facilities and from providing services to neighboring communities. The AG concludes that the Commission should not find the "learnings" to be a reliable benefit or the Project to be prudent in light of these limitations.

The AG notes that if studying the connection of third-party DER to the grid is the true purpose of the project, the Project should have been designed where third-party DER already exists or is expected to develop under the recently enacted Future Energy Jobs Act. Public Act 99-0906. An urban area with only 0.38 kW of DER, where ComEd will orchestrate the development of DER and possibly own or lease it, is not a typical or favorable situation to study the integration of third-party DER. The AG adds that as of December 31, 2016 there were 12.51 MW of net metered DER on ComEd's system, but ComEd witnesses could not identify any microgrids other than the IIT project, let alone microgrids that contain DER. The AG maintains that this shows that most DER will be

integrated directly into the distribution grid, and not through a microgrid. While ComEd now apparently asserts that the integration of DER is a "purpose" of the Project, it has not shown that a microgrid or the associated extraordinary distribution investment described in this docket is the best way to learn how to integrate third party DER into the grid, or that the alleged "learnings" from the Project will transfer to single, non-microgrid DER projects.

The AG also concludes that the public safety and cybersecurity benefits ComEd cites are too vague to be meaningful. While ComEd argues that the Project will have "a direct immediate, positive impact on public safety," these purported impacts are stated in only the most general terms. For example, ComEd refers to the CPD Headquarters "as well as various critical systems," but fails to identify any other critical entities, systems or functions that will be affected by the Project. The AG notes that ComEd's claims were long on generalities, suggesting that "the Project will provide added stability, significantly and positively impacting the public safety operations of the City of Chicago as well as those within the Chicago Urban Area who depend on the systems, processes, and tools that operate under and through the public safety agencies of the City of Chicago." The AG asks the Commission to require ComEd to identify more specific and concrete project effects before finding the project prudent.

The AG notes that ComEd has taken action to ensure that first and emergency response services are able to operate in an emergency or major event. For example, after the 2011 series of storms that resulted in widespread power outages, ComEd took action to work with local governments to prioritize restoration of power for critical functions. The AG refers to ComEd's establishment of a Joint Operation Center or "JOC" to enable local governments to identify restoration priorities both ahead of time and during an outage crisis, and to work with ComEd to restore service based on local priorities. The AG compares these efforts that allow local officials the flexibility to identify what affected services need to be restored first, to ComEd's unilateral decision to provide exceptional service to the twelve block Project area.

The AG concludes that the benefits ComEd claims for customers who are not in the microgrid are vague, not quantified, and ultimately speculative and inchoate. While ComEd argues that the Project will benefit all customers because the "learnings" will enable ComEd to "more effectively" design its grid, to support "widespread implementation of microgrid capabilities," and to respond to "grid-connected DER," these are all functions that ComEd already performs. The AG cites the fact that ComEd's distribution grid design is in the midst of a multi-billion dollar modernization program pursuant to Section 16-108.5(b)(1) of the Act. The AG asserts that innovation dollars would be better spent on projects that have direct application to the distribution grid and do not require utility-procured generation. Referring to recently passed legislation that will require adoption of more DER, the AG concludes that because most DER will not be in microgrids, but rather will connect directly to the distribution grid, ComEd should prepare for widespread development of non-microgrid third-party DER and should focus on the role of the distribution utility to incorporate the growth of distributed solar PV, community solar PV, and the development and use of "smart inverters." 220 ILCS 5/16-107.5(k)(1)(community solar); 220 ILCS 5/16-107.6 (distributed generation rebate and smart inverters); 20 ILCS 3855/1-75(c)(1)(A)(i) (three million renewable energy credits for

each year shall come from solar photovoltaic projects). The AG maintains that ComEd's attention to a ComEd-built and procured "utility-scale" microgrid distracts from the innovation research that recent law and anticipated third-party DER need.

3. ELPC/Vote's Position

ELPC/Vote state that it agrees with ComEd that the role of the utility is changing and that the central station model is changing to incorporate DER. Similarly, no one argues that ComEd should not be concerned about grid reliability and security. However, ComEd fails to demonstrate that the microgrid it proposes actually addresses either concern in a meaningful way. ComEd also fails to demonstrate that it optimally designed the proposal to produce the most "learnings" possible – part of the prudency review. ELPC/Vote, Staff, and CUB/EDF witnesses all agree that Phase I will produce most of the valuable information to be learned from this project, and that Phase II adds significant additional expense without adding much additional value. ELPC/Vote witness Morretton explains:

> In her testimony, Dr. Bahramirad argues that Phase 2 provides learning beyond the "limited configuration" Phase 1 microgrid that justifies the additional cost. (Bahramirad Rebuttal Testimony, line 152). In my opinion, the learnings that ComEd would obtain from expanding the microgrid beyond Phase 1 to Phase 2 are not justified. Phase 2 adds additional load and significant instrumentation and automation. The automation and instrumentation will not provide useful learning that has not already been gathered in research microgrids, such as IIT's. In addition, the instrumentation is overkill given existing measurement devices. For example, ComEd is proposing 21 Phaser Measurement Units (PMUs) for Phase 2. ComEd already has deployed Advanced Metering Infrastructure (AMI), ABB's Outage Management and Distribution Management software system, revenue quality meters, ComEd's proposed newly designed and controllable smart inverters, and existing SCADA devices. Each of the above digital devices provide data recording capabilities for ComEd microgrid research purposes, and would exist on any microgrid deployed in ComEd's territory.

ELPC/Vote Ex. 2.0 at 4-5. This is an example of ComEd failing to justify its proposed spending, where customers would get very little benefit from the increased spending on PMUs. ELPC/Vote find that this sounds futuristic and exciting, but ComEd fails to do the cost-benefit analysis that justifies the expense.

ELPC/Vote also argue that the location of the microgrid diminishes the potential to benefit customers. While ComEd argues that the Project is a pilot and that this makes the location less critical, the fact is that ComEd chose a location where residents already benefit from highly reliable service and the choice reduces the opportunity to learn. ELPC/Vote witness Moretton notes, "It is clear that the Bronzeville area is more reliable

than ComEd's system as a whole, as the frequency of outages is slightly lower than ComEd's average and the duration is significantly lower." ELPC/Vote Ex. 1.0 at 10. Specifically, customers suffer 0.93 outages/year in the Bronzeville area, with an average duration of 43 minutes per year compared to the system wide average of 152 minutes. Id. He also adds that the service in Bronzeville is better than the U.S. average. Id. Additionally, the few outages that occurred would not have been prevented by the microgrid. Staff witness Rockrohr testifies:

> ComEd provided a list of all interruptions on its distribution circuits that supply the Project area during the years 2012 through 2016. The information ComEd provided shows that all interruptions that occurred during that timeframe were due to problems involving the distribution facilities themselves, including interruptions caused by animals, trees, underground equipment failures, overhead equipment failures, and similar causes. The data ComEd provides indicates that the outages experienced by customers served by the circuits in question during that period would have occurred regardless of the existence of a microgrid. A microgrid relies upon the underlying distribution facilities to supply customers, regardless of whether it is in an island configuration or is connected to the larger grid. Accordingly, if the underlying distribution facilities fail, the microgrid cannot keep all connected customers in service.

Staff Ex. 2.0 at 7. ELPC/Vote continue that besides the location being inappropriate because it has high reliability, it is also inappropriate because the critical services within the microgrid will not be able to adequately serve the surrounding community. No one disputes that microgrids can provide valuable benefits in cases of disaster and terrorist outages that can last for days or weeks and cause extreme distress for communities. However, ELPC/Vote state that safeguards are still needed to ensure that ComEd is implementing the microgrid to produce optimal benefit and real "learnings." ComEd witness Masters, a security expert, notes real dangers from cyber attacks and other acts of terrorism, as well as from natural disasters. ComEd Ex. 6.0 at 5-13. He adds that Bronzeville houses both a police and fire station, as well as "grocery stores, restaurants, banks, etc. that benefit both Bronzeville and the surrounding neighborhoods." Id. at 17-18. Yet, the microgrid footprint encompasses only a section of Bronzeville and not the best section for a microgrid. ELPC witness Moretton points out several factors that make the chosen area less than optimal:

> While ComEd lists several critical infrastructure entities in Bronzeville, only the Chicago Police Department headquarters and Chicago Public Library are under government control to provide public access in emergency scenarios. In addition, per ComEd's answer to AG 4.05-c, the Chicago Police Department has an existing backup generator; it is questionable how much additional reliability the microgrid will provide to the Police Department. Bronzeville microgrid

> has no fire stations, no airports, no transportation hubs, no water utilities, no public shelters (warming or cooling), and no clean water source. If ComEd's microgrid project was part of a larger Chicago resiliency plan, the benefits might be better quantifiable.

ELPC/Vote Ex. 1.0 at 13. Along these lines, ELPC/Vote stress that the microgrid footprint does not contain the kind of critical services needed to serve a significant population in the surrounding community. Mr. Morretton notes the grocery store is a neighborhood store, Jimmy's Foods. The gas station is a small BP with only three pumps. There are only two banks, one credit union and one ATM. These do not constitute the level of services that can handle the level of traffic needed in the event of a wide spread electrical outage. Id. at 14.

ELPC/Vote argue that if the goal is to serve thousands of people surrounding the microgrid, then the microgrid should contain large stores, banks and gas stations that have high capacity. Ironically, just across the street from the border of the microgrid is a Jewel and a Walgreens in Lake Meadows Shopping Center at 35th and King Drive. Tr. at 53. On cross-examination, the AG asked ComEd witness Bahramirad about the lack of a major grocery store or pharmacy within the microgrid, and she said she did not recall ComEd considering either of those important factors. ELPC/Vote contend that this lack of knowledge and planning reflects the poor choice of location for the pilot. Other than the police and fire stations, the grocery store may be the most important business in the microgrid.

ELPC/Vote submit that ComEd's failure to demonstrate that this location is a reasonable choice to serve customers in the area mirrors that of Baltimore Gas and Electric Company in 2016. ELPC/Vote state that the Maryland Commission reached the conclusion that Baltimore Gas and Electric Company had chosen an unsatisfactory location noting, "To justify the surcharge on all ratepayers, BGE claims that the benefits of each public purpose microgrid would extend to other, non-microgrid customers throughout BGE's service territory, assuming non-microgrid residents are able to travel to the microgrid location during an outage event. BGE does not provide factual support for this claim." Baltimore Gas And Electric Co., Case No. 9416, Order No. 87669 at 9. The Commission further noted, "[I]t is not immediately apparent to us that these establishments are equipped to handle a large number of visitors to the microgrid during a major outage event." Id. ComEd's failures mirror Baltimore Gas and Electric Company's.

ELPC/Vote continue that ComEd's failure to incorporate more DER diminishes the value of the Project. The research benefits or "learnings" associated with ComEd's proposed Phase II are sharply diminished by the decision to use diesel and natural gas generators rather than PV solar and batteries to provide power for that phase of the Project. There is no doubt that the evolution of the grid toward DERs cited by ComEd witness Svachula is a key driver of the need for this pilot (ComEd Ex. 1.0 at 1), and is accelerating in Illinois in large part due to the passage of the FEJA, which creates robust targets and incentives for deployment of solar PV. ELPC/Vote explain that it is the integration of high-penetration solar PV along with the addition of battery storage that poses the most immediate opportunities for grid benefits and the most urgent need for

data so that these benefits can be maximized. As witness Barbeau describes, ComEd's proposal to DOE for the SHINES grant that partially funds the proposed Project focused significantly on microgrid performance in a high-penetration renewable DER scenario:

> For this project, the ComEd/IIT proposal to the DOE for the SHINES grant focused on deploying "high-power solar PV and a high-power battery energy storage system (BESS) in the Bronzeville Community Microgrid." The original proposal stated that total installed solar and storage capacity within the project will achieve instantaneous penetration levels between 20% and 35% of the microgrid's peak load. Further, it proposed that the "integrated solution will be scalable to significantly high levels of penetration with standardized and proven external and internal interoperability capabilities." The proposal describes the innovation contained in the project as addressing "one of the key barriers for the high penetration of solar PV systems: the seamless integration of these systems in utility grids."

CUB/EDF Ex. 1.0 at 13-14. ELPC/Vote state that unfortunately Phase II significantly dilutes the penetration of renewable DER by the addition of 7 MW of "controllable" DER, defined as natural gas or diesel generators, marginalizing the 0.75 MW of solar generation included in the Project. Therefore, the pilot will only answer questions related to understanding the benefits of and challenges associated with high penetration of solar and storage during Phase I of the Project. At the onset of Phase II, solar PV and storage will comprise a much smaller proportion of the generation supporting the microgrid operation when it is islanded, and no further learnings about microgrids in a high-penetration renewable energy scenario will be gained.

ELPC/Vote note among the benefits associated with testing microgrid functions in a high-penetration renewable DER scenario is better understanding the benefits from procuring a range of grid services from aggregated DER owners, and then determining a fair level of compensation for those services. As witness Barbeau described, FEJA creates a pathway for compensating distributed solar projects for the additional grid benefits made possible by the smart inverters connected to those projects. CUB/EDF Ex. 1.0 at 13. The level of this compensation will be a matter before this Commission in the coming years. Therefore, there is growing need for additional data upon which to base the level of compensation. Witness Svachula agrees that, "[u]nderstanding how the private market can supply distribution-functionalized DER is a key learning." ComEd Ex. 7.0 at 18. By using diesel and gas generators for the vast bulk of the generation resources included in the project, ComEd misses the opportunity to create data and experience that would help to inform upcoming policy decisions for the Commission.

ELPC/Vote find similarly that there is a need for data to assess the value the additional resiliency benefits that higher penetrations of solar and batteries on the grid could provide. Utilities and regulatory commissions across the country are working to define metrics for resiliency, and measure how distributed renewables contribute to resiliency. ELPC/Vote state that projects like the ComEd microgrid pilot could, if carefully designed, contribute meaningfully to the creation of mechanisms to use customer-sited

renewables to make the grid both more secure and less costly by avoiding the need for traditional distribution system upgrades.

ELPC/Vote add that ComEd has offered no explanation as to why it is using fossil generators to power the microgrid in Phase II, other than to argue that the generation must be "controllable." Yet, the intermittency of solar generation is mitigated by the battery storage rendering it "controllable." As noted by witness Morreton, there is an estimated 38 MW of suitable rooftop space among the buildings within the microgrid footprint upon which to site more than enough solar PV to power both phases of this Project. Moreover, ComEd has committed to contracting for the rights to third-party owned DER for the project through a bidding process, although it is not clear from ComEd's testimony whether ComEd has a clear plan to leverage the FEJA incentives to expand the pool of DER owners in the Project footprint, nor has ComEd indicated an intent to substitute solar and storage for fossil-fueled generation which could both reduce Project costs and create opportunities for more useful learnings.

ELPC/Vote detail that witnesses Rearden, Rockrohr, Morreton, Barbeau and Selwyn all testified that ComEd had not clearly demonstrated that Phase II of the Project would produce information that justifies the costs of the Project. A critical question for the Commission is whether Phase II of the Project is prudent. However, if ComEd changes the Project to use customer-sited distributed solar combined with battery storage to support Phase II of the microgrid, the value of the learnings would be substantially greater, while the costs could be substantially lower. Redesigning Phase II to incorporate higher levels of customer-sited distributed solar, combined with battery storage would help to both lower and justify the costs of the project.

ELPC/Vote observe that ComEd's failure to incorporate more solar and storage into Phase II of the Project is similar to Baltimore Gas and Electric Company's failed microgrid project in Maryland. While Baltimore Gas and Electric Company's proposal relied exclusively on natural gas and diesel generation instead of renewable energy and storage, ComEd's proposal has only .75 MW of solar in Phase I and none in Phase II. The Maryland Commission criticized Baltimore Gas and Electric Company's lack of generation diversity, concluding that the Baltimore Gas and Electric Company project "cannot capture the full breadth of potential benefits that public purpose microgrids could offer through fuel-diverse generation." Baltimore Gas And Electric Co., Case No. 9416, Order No. 87669 at 14. Ultimately, as part of its Order rejecting Baltimore Gas and Electric Company's proposal, the Maryland Commission noted its "disappointment" that the proposal did not contain "forward-looking generation and storage concepts to test whether these elements could work in Maryland and be replicated in future microgrid projects." Id. ELPC/Vote submit similar to Baltimore Gas and Electric Company, ComEd's Phase II proposal fails to sufficiently incorporate "forward-looking" technologies that could help position Illinois to integrate higher levels of distributed renewables, and produce information that justify the costs of the Project.

4. CUB/EDF's Position

CUB/EDF argue that the Commission and ComEd should use this Project to determine how to optimize a microgrid using primarily renewable DER and energy storage while improving safety and customer service as it does so. CUB/EDF Ex. 1.0 at 12-13.

However, CUB/EDF believe that the enormous amount of data collected over the course of the project can inform not only other microgrid projects but how new technological advances can be integrated and deployed elsewhere in the distribution system. CUB/EDF Ex. 1.0 at 26. Mr. Barbeau's testimony described how the Project can leverage the DER investments encouraged by FEJA. CUB/EDF Ex. 1.0 at 10. Therefore, CUB/EDF believe this Project, and microgrids generally, can provide a platform to test the potential for integration of load management as a significantly more cost-effective option to new generation. Id. Finally, this pilot – and other microgrids that follow – can provide a platform for testing potential new services provided by smart inverters connected to DER, such as voltage support, VAR support, islanding services, frequency services, or other capabilities to support the integration of renewable DER. CUB/EDF Ex. 1.0 at 13, citing 220 ILCS 16-107.6(b).

To that end, CUB/EDF recommend that the Project should be structured around specific hypotheses for testing so that all the data and project experiences can be clearly documented and shared. CUB/EDF Ex. 1.0 at 13. ComEd has committed to provide annual reports to the Commission regarding its progress on the Project and regarding the results of the competitive bid process in one of those annual reports. ComEd Ex. 15.0 at 9. These reports can include the specific hypotheses and data collected which can inform future discussions around the costs and benefits of microgrid projects.

In order to realize these benefits, CUB/EDF believe that the Project must include the improvements made throughout the docket such as commitments that ComEd will not own generation assets, stakeholder involvement and input in the RFP process, and, importantly, development of a pilot microgrid services tariff.

5. Commission Analysis and Conclusion

The Commission agrees with ComEd that benefits of the Project are not limited to the customers within the Project footprint and those it directly affects, but that the benefits derived from the learnings gained through the Project will benefit every customer that takes electric delivery service in an increasingly complicated distribution-system environment. The Commission finds the Project will benefit all ComEd customers because, as ComEd states, the learnings acquired during the process of designing and operating the Project will enable ComEd to more effectively design the larger distribution grid, to support the possibility for widespread implementation of microgrid capabilities, and to respond to increasing penetrations of DER. A finding that the Project will only benefit the customers in the microgrid area is contrary to the record.

The AG criticizes the footprint of the Project because it lacks a large grocery store, drugstore, hospital, firefighting facility, or major business. The Commission agrees with ComEd that the microgrid's small size and the nature of the pilot will not allow every type of building or social service infrastructure to be included in the Project. The Commission further finds that having the CPD Headquarters included in Phase II will provide significant learnings, especially as they pertain to safety and reliability of the grid.

The Commission reasons that the Maryland PSC order pertaining to Baltimore Gas and Electric Company is inapplicable here. First, the Commission is bound by the record in this case, not by outside State Commission orders. Commonwealth Edison Co. v. Ill.

Commerce Comm'n, 389 Ill.App.3d 510, 521 (2nd Dist., 2009). Second, the Maryland project utilized only natural gas and diesel DER, while ComEd's Project proposes solar PV and battery storage. Lastly, the Maryland PSC determined that the utility did not present any tangible metrics by which to measure the success of the microgrid. Here, ComEd has presented substantial metrics upon which to evaluate both Phases of the Project.

D. Cost of the Project

1. ComEd's Position

ComEd estimates the maximum net cost to ComEd of the Project to be $25 million, after applying the $4 million DOE grant and $600,000 cost sharing with research partners. ComEd explains this estimate represents the top of the range of costs ComEd expects to incur, and includes the cost of distribution equipment such as cables, poles and wires, as well as an estimated cost of DER. In addition to the cost of construction, ComEd expects the annual cost of operation to be approximately $200,000, depending on the final composition of the portfolio of DER, and the terms of the necessary arrangements with third-parties.

ComEd contends that the estimated cost is reasonable in light of the value of the learnings ComEd expects to gain from the Project. ComEd notes that the costs enable deployment of a full-feeder configuration for the Project. ComEd explains that feeders are the building blocks of the distribution system, and therefore ComEd expects that future utility-scale microgrids will be implemented using full feeder configuration. ComEd states the learnings associated with the full-feeder configuration will support design and implementation of other future microgrids and can be utilized in developing the architecture of the grid in the future, enabling a future vision of Illinois with high DER penetrations on the grid.

ComEd argues that a decrease in the size or scope of the Project will significantly decrease the value of the learnings available from the Project, but will not produce a proportional decrease in cost. As a result, ComEd contends that its proposed configuration for the Project represents the most cost-effective use of resources.

ComEd states that Staff's proposed configuration for the Project would significantly limit the learnings available from the Project. ComEd explains Staff's proposal, due to its smaller size, will limit the installation of sensors, limit the operational scenarios, reduce the diversity of the microgrid topology, and exclude key customers and facilities, including a portion of the CPD Headquarters, one of the most critical public service facilities in the City of Chicago. In addition, ComEd states Staff's limited configuration does not incorporate or study microgrid behavior on a full feeder and, thus, limits the opportunities for installing, operating, and studying control and measurement devices to be installed within the demonstration microgrid. Although this configuration may cost approximately $12.3 million less than the configuration ComEd has proposed, ComEd explains that the limited learnings available from this configuration make it an ineffective use of resources. ComEd further explains that it considered modifications to Staff's configuration that would add the full CPD Headquarters, approximately 95 additional customers, additional load and DER, and additional DA devices and PMUs, which together would enable ComEd to

capture many of the learnings of the full Project. However, ComEd contends that even these augmentations to Staff's configuration do not result in a practical or cost-effective alternative, because the augmented configuration would include approximately 475 fewer customers and three fewer customers providing critical public services, 1.5 MW less load, and less third-party DER than the Project. Moreover, the difference in cost between this augmented configuration and the full Project would be minor – only approximately $3 million. ComEd concludes that neither Staff's suggested configuration nor the augmented configuration ComEd developed in response would be a cost-effective use of resources and neither option should be approved.

ComEd also states that ELPC/Vote is incorrect in stating that Commission approval of the Project as prudent and reasonable, based on the high-end cost estimates ComEd presented in this proceeding, will reduce the Company's incentive to protect its customers. ComEd explains that a Commission order confirming that the decision to proceed with the Project at the forecasted total cost is prudent does not pass on the prudence and reasonableness of operating-level decisions made or expenditures incurred in the execution of the Project. Those decisions and costs will be evaluated in formula rate update proceedings, as the costs are incurred and the assets go into service. 220 ILCS 5/16-108.5(b-5). ComEd adds that annual review of expenditures and implementation decisions protects customers from the hypothetical risk ELPC/Vote describes, just as it does with respect to every other operating level decision or expenditure that affects a utility's rates and costs.

ComEd continues that the Commission should reject the AG's argument that it should not make any conclusions about the prudence, reasonableness, or viability of the Project until the cost and other terms governing the procurement of project energy resources are established. ComEd states it has agreed to lead workshops with non-vendor stakeholders to discuss terms of the procurement for non-storage DER, and has proposed a detailed workshop process that is modeled on prior successful workshops. ComEd submits that it has proposed a set of essential procurement terms and criteria for selection of winning bids and has committed to filing a report with the Commission detailing the results of the competitive bidding process, in sufficient detail to enable review and evaluation of the procurement. ComEd has also committed to filing a report with the Commission if the Company receives no qualified bids in the procurement process. ComEd contends that these commitments ensure that the procurement will be carried out in a fair, prudent, and reasonable manner. Furthermore, the costs to procure DER for the Project will be subject to Commission review in annual formula rate update proceedings. ComEd stresses that review will ensure that only prudent and reasonable costs associated with the Project will be included in ComEd's rates.

ComEd also argues that the Commission should reject ELPC/Vote arguments that ComEd's estimated cost of the Project is very expensive for its size, stated objectives, and likely benefits, based on a comparison between the Project and the IIT microgrid. ComEd states the comparison of the Project and the IIT microgrid on which EPLC/Vote rely is neither valid nor complete. ComEd notes the testimony on which this comparison is based is both factually incorrect and understates the intellectual and practical effort and innovation required to cluster microgrids. ComEd explains the Project will be the first cluster of utility and third-party-owned microgrids, and will be capable of coordinating load

and resources across the boundary between the individual microgrids. ComEd notes the DOE awarded ComEd a grant to support its development of the MMC, which is capable of controlling the ComEd microgrid and integrating it with other microgrid systems, and which supports the conclusion that clustered microgrids are innovative and worth exploring. ComEd explains that its MMC is capable of all of the functions of IIT's existing controller, as well as significant additional advanced functionalities. In light of the additional complexity of the Project over the IIT microgrid, ComEd reiterates that it is inappropriate to evaluate the cost of the Project by comparing it to the cost of the IIT microgrid.

Likewise, ComEd contends the AG's claims regarding the cost-per-customer of the Project should be rejected. In keeping with its theme of simply ignoring the benefits of Project learnings, ComEd notes the AG suggests that the Project would cost on average $388.03 per month per customer if only customers in the Project footprint were responsible for all Project costs. ComEd asserts this figure has no relevance to ComEd's proposal. ComEd does not and never has proposed recovering the cost solely from the customers served by the Project itself. ComEd has proposed to recover Project costs from all customers generally because the benefits of the learnings will be enjoyed by all customers and the public generally. ComEd states the Commission should no more be misled into judging this demonstration Project by the cost per customer in the demonstration footprint than should society measure the cost of testing a new drug by dividing the research and study by the small number of patients in the trial. Rather, ComEd maintains, the benefits and the costs must be viewed generally.

ComEd further states the Commission should reject the AG's attempt to extrapolate the per customer cost of the Project to a system wide microgrid rollout. ComEd states the AG apparently assumes that such a hypothetical system wide rollout – a situation entirely of the AG's invention that is not at issue in the case – would involve cloning the demonstration Project across ComEd's entire service area, and that all such microgrids will require the same per-customer monthly revenue requirement of $388.03 as the AG attributes to the Project. ComEd asserts the Commission should reject the AG's attempts to inflate the cost of the Project.

2. AG's Position

The AG observes that the Project is estimated to cost up to $29.6 million to serve 1,060 customers and seven megawatts of load, which will be subsidized by $4.6 million in grants. The AG notes that while ComEd declined to produce the effect of the Project on ComEd's delivery revenue requirement, AG witness Dr. Selwyn calculated the cost of the Project to consumers and calculated the rate impact if cost recovery were limited to the 1,060 customers within the microgrid as a way to match the costs to the benefits. The AG presents Dr. Selwyn's conclusion that based on the subsidized cost of $25 million and assuming a 40-year amortization of the investment as indicated by ComEd, the cost to customers within the microgrid area to recover the revenue requirement effect of the $25 million project is $388.03 per month per customer. AG Ex. 2.0 at 22, Table R1-line 16. The AG recognizes that this figure does not take into account rate design (how the cost is recovered), meaning that some customers may pay more and others may pay less,

and it does not assume recovery as a monthly charge, a usage charge or a demand charge.

The AG points out that although ComEd bears the burden of proof, ComEd claimed that it was "impractical" to calculate the rate effect of the proposal and did not offer a comprehensive quantification of the rate impact. The rate impact finally included in ComEd witness Newhouse's testimony is woefully inadequate as he did not apply basic ratemaking principles to the cost. Mr. Newhouse simply divided the $25 million net cost three different ways: by (1) total kW, (2) total kWh, and (3) number of customers for ComEd as a whole and for the Project area. The AG points out that Mr. Newhouse did not add the cost of capital, factor in the cost of depreciation, include the effect of taxes, and he excluded operating expenses entirely. Referring to Mr. Newhouse's suggestion that "based on best available data," the cost is $595.24 per year, or $49.60 per month if recovered from consumers within the project area, the AG finds that the cost of the Project if recovered from consumers within the project area is still excessive. The AG notes that Mr. Newhouse's understated costs did not include ordinary regulatory costs or any operations expense, resulting in an understated rate effect.

The AG asserts that the Commission should reject ComEd's inadequate and inaccurate rate estimate and further decline to find the Project prudent because ComEd failed to meet its burden of proof "to establish the justness and reasonableness" of the cost of the proposed project. 220 ILCS 5/9-201(c). The AG adds that ComEd's failure to address the cost, if paid by those within the microgrid, violates a key term of the DOE grants for Phase I: whether the project will reduce the total time of interruptions of service "at a cost comparable to traditional options such as an uninterruptable power supply with a back-up generator."

AG witness Selwyn considered several cost scenarios to enable the Commission to evaluate the cost of the Project to ComEd's customers. Applying established ratemaking principles and reducing the $29.6 million cost by the DOE and other third-party funds to $25 million, Dr. Selwyn testified that the annual cost of the project was $4.9 million. AG Ex. 2.0 at 22, Table R1-L12. If allocated to the 1,060 customers within the microgrid who will receive the direct benefit, the average cost per customer is $388.03 per month; if the cost is spread across all 3.9 million ComEd customers, however, the true cost of the project is masked, and drops to no more than 11.22¢ per month. AG Ex. 1.0C at 54, Table 6. Dr. Selwyn's analysis incorporates ComEd's assertion that the costs would be collected over 40 years, and reasonable assumptions about the costs of operation as well as the costs of capital. AG Ex. 2.0 at 11, 12-16. The AG points out that the cost per year calculated by AG witness Selwyn is reduced when project costs are collected over 40 years, rather than the 20- to 30-year cost recovery period suggested by Direct witness Hawes.

The AG asserts that when the Project cost is matched to the benefits, it is clear that it is excessive and cannot be considered reasonable. The exorbitant cost-per-customer of a "utility-scale" or "neighborhood" microgrid is a key piece of evidence in this docket. The AG notes that ComEd has made clear that it considers microgrids to be a distribution investment that "can be applied in future distribution system design across the service territory," and that Dr. Selwyn demonstrated that if ComEd installed microgrids across its entire service area at the same cost as the Project, the estimated gross

investment would rise to $110 billion, and the annual revenue requirement effect would be $19.86 billion, pushing the per-customer-monthly revenue requirement up by $388.03. AG Ex.1.0C at 51-52, Tables 5 and 6. Even if only 10% of ComEd's service area were covered by microgrids, the additional total capital investment would be about $11 billion, the annual revenue requirement would increase by about $1.98 billion, and customer bills would increase an average of $41.85 per month. AG Ex. 1.0C at 57-59. Even if only 10% of ComEd customers were served by a microgrid equivalent to the project, it would increase ComEd's most recently approved revenue requirement of $2,720,884,000 by 72.8%. AG Ex. 10.C at 57, 58, Table 7; Commonwealth Edison Co., Docket No. 17-0196, Order at 42 (Dec. 6, 2017). The AG insists that the Commission must consider the cost when assessing the scope and implications of the Project.

3. Staff's Position

Staff recommends approval of a modified Phase I. While Phase I of ComEd's Project is relatively low to ratepayers, at $7.8 million, and the learnings from operating a microgrid appear to be valuable, the Company has not proven that the value of the learnings of Phase II are worth the cost of Phase II, at an additional $17.2 million. Nevertheless, Staff acknowledges the value of clustering the Bronzeville microgrid with the IIT microgrid and proposes a modified Phase I microgrid that has the same footprint as the proposed Phase I, but with an interconnection to the IIT microgrid. Staff's proposal would save ratepayers an estimated $12-$14 million compared to the demonstration microgrid ComEd proposes. Staff Ex. 2.0 at 11.

Staff observes that ComEd argues that a decrease in the size or scope of the Project will decrease the value of the learnings available without a proportional decrease in cost. ComEd estimates that the incremental cost of Phase II, over the cost of Staff's proposed modified Phase I, is $12.3 million. ComEd Ex. 9.0 at 7. ComEd asserts that the additional $12.3 million is justified by the potential incremental learnings associated with Phase II. Id. At the same time, ComEd explains that it has not attempted to quantify the value of the incremental learnings to be gained from Phase II of the Project. Further, the Company argues that it is not possible to quantify the value of that information. Staff states that given the uncertainty as to the value of the Phase II learnings, the Commission must necessarily be hard-pressed to find that the benefits of Phase II exceed its $12.3 million costs.

Staff reasons that the smaller demonstration microgrid that Staff recommends would be a fully functioning microgrid that satisfies all of the DOE grant requirements and would provide clustering with the IIT campus while simultaneously saving ratepayers $12.3 million. ComEd Ex. 9.0 at 7. Staff concludes that ComEd identifies its Project as scalable and thus the smaller and less costly demonstration microgrid that Staff recommends the Commission approve in this docket could be expanded in the future if need for such an expansion exists. Staff Ex. 2.0 at 10.

4. ELPC/Vote's Position

ELPC/Vote witness Moretton is highly critical of ComEd's proposed cost for the Project. He states that the Project is very expensive for its size, stated project objectives and likely benefits. Mr. Morreton states that though it is similar to IIT's migrogrid, it is

three times the cost, which does not seem justified. ELPC/Vote Ex. 1.0 at 15. In his rebuttal testimony, Mr. Morretton takes further issue with the inflated costs and questionable assumptions in ComEd's proposal:

> According to ComEd, the $7.5 million figure for solar and battery storage includes $5 million for real estate costs. Given the proposed third-party procurement model, this cost should be removed from the budget. In addition, I recommend that ComEd, or the 3rd party DER owner, should inquire with building owners in the Bronzeville microgrid footprint about their interest in contributing rooftop real estate to the microgrid for mounting solar PV arrays. There is a combined potential of 2.2 MW roof-top solar PV in the five Bronzeville Microgrid Phase I buildings, listed as "critical infrastructure facilities" by ComEd. The buildings with their solar rooftop potential are:
>
> CPD Headquarters: 533 kW
>
> De La Salle Institute: 727 kW
>
> Perspectives Math & Science Academy: 245 kW
>
> Chicago Bee Public Library: 48 kW
>
> IIT (3440 S. Dearborn): 626 kW.

ELPC/Vote Ex. 2.0 at 3. ELPC/Vote state that given that there is 2.2 MW of rooftop solar potential in just these five buildings, there is ample rooftop potential in the Phase 1 microgrid footprint for the 750kW of proposed solar. ELPC/Vote estimate that there is a significant rooftop solar potential of 38 MW in the 60653 zip code, a rough approximation of the Bronzeville neighborhood. ELPC/Vote argue that having these building owners (or others in the Phase 1 footprint) lease their rooftops in exchange for their building being inside the microgrid would allow the $5 million ComEd allocated to real estate for the Bronzeville microgrid to be removed from the budget, reducing the required budget for the "limited configuration" Phase 1 to $12,300,000, or $7,700,000 after the DOE grant and partner cost-sharing. Id.

ELPC/Vote suggest that in addition to the high costs and costs that can be avoided, the Commission should address ComEd's overall approach to costs. ComEd requests approval of costs based on the outer limits or "worst case scenario" of its projections. ComEd witness Bahramirad states, "Nonetheless, the cost estimate is relevant in the event that lease costs contain a real estate component or some pass-through of real estate costs. Like all components of the cost estimate I provided in my direct testimony, the real estate costs were intended to provide a maximum estimate." ComEd Ex. 9.0 at 20. In her surrebuttal she similarly states, "However, the budget provided above, like those in my prior testimonies in this proceeding, is intended to reflect the high-end cost where ComEd expects a range of costs." ComEd Ex. 17.0 at 12; ComEd Ex. 15.0 at 20. ELPC/Vote assert that while this may make sense at first glance, it violates fundamental regulatory principles that ComEd must act prudently and that costs must be just and reasonable. ELPC/Vote stress that ComEd essentially asks for Commission up front

approval to pay at the highest price possible, and once the Commission grants such approval then it reduces the Company's incentive to protect its customers.

5. Commission Analysis and Conclusion

The cost of the Project is estimated to be a maximum of $25 million, after applying the $4 million DOE grant and $600,000 cost sharing with research partners. ComEd contends that its proposed configuration for the Project represents the most cost-effective use of resources. The Commission finds that a modified Phase I, as proposed by Staff, would cost less than ComEd's, but would capture significantly less learnings. The Commission agrees with ComEd that Staff's proposal will limit the installation of sensors within the microgrid, limit the operational scenarios, reduce the diversity of the microgrid topology, and exclude key customers and facilities, such as a portion of the CPD Headquarters, one of the most critical public service facilities in the City of Chicago. The Commission finds that Staff's limited configuration does not incorporate or study microgrid behavior on a full feeder and, thus, limits the opportunities for installing, operating, and studying control and measurement devices. Augmentations to Staff's modified proposal that might allow ComEd to capture many of the learnings of the full Project would only reduce the total Project costs by approximately $3 million. Thus, the Commission agrees with ComEd that a decrease in the size or scope of the Project will significantly decrease the value of the learnings available from the Project, but will not produce a proportional decrease in cost.

The Commission rejects ELPC/Vote's argument that the proposed Project is too costly compared to the existing IIT microgrid. The Commission agrees with ComEd that the two microgrids are incomparable because the Project will be the first cluster of utility and third-party-owned microgrids, and will be capable of coordinating load and resources across the boundary between the individual microgrids. Also, the Project includes an MMC, which is capable of controlling the ComEd microgrid and integrating it with other microgrid systems, and which supports the conclusion that clustered microgrids are innovative and worth exploring. ComEd's MMC is capable of all of the functions of IIT's existing controller, as well as significant additional advanced functionalities. The Commission finds ELPC/Vote's argument inapposite.

E. Cost-Benefit Analysis

1. ComEd's Position

ComEd contends that claims by some parties that prudence cannot be confirmed without a quantified cost-benefit analysis is both incorrect and inherently illogical. ComEd states that the Commission, and other regulatory bodies, commonly make policy decisions based on qualitative judgments and estimates of future benefits and needs. ComEd argues that a quantified cost-benefit analysis is not a prerequisite for a finding of prudence and reasonableness, and that the Commission has expressly rejected arguments that economic evaluations are necessary to support the prudence and reasonableness of utility projects in the past. ComEd notes that utility proposals are often driven by some combination of safety, reliability, and convenience – considerations that cannot be quantified – in addition to cost, and that such proposals are consistently found to be prudent and reasonable.

ComEd contends that these themes are echoed in the case law, pointing to Ill. Power Co. ComEd states that, in that case, the Appellate court reversed a Commission order that found a utility's determination to retire a propane plant was imprudent and unreasonable because the utility had not presented an economic analysis supporting the determination. ComEd states the court noted that the utility's decision had been driven by a convergence of factors, including safety, reliability, flexibility, and the risk of liability in the event of a plant failure presented by increasing residential development in the area. The Commission had considered each factor individually, and rejected each as a prudent basis for retiring the plant in the absence of an economic analysis; the court found that this course of action by the Commission was unreasonable. ComEd contends Ill. Power Co. supports the conclusion that an economic or cost-benefit analysis is not a prerequisite to a prudence determination, and the absence of such an analysis cannot support a determination of imprudence, when other non-quantifiable factors support prudence. Ill. Power Co. at 425.

ComEd states that this case concerns a demonstration with inherently forward-looking benefits derived from the future applications of learnings that can be identified and characterized, but not quantified in the same way as other, more discrete or routine endeavors. ComEd notes that traditional cost-benefit analyses completely exclude the value of the opportunity to learn because there is no known mechanism for identifying and quantifying, in advance, the learnings that a project may generate. Therefore, ComEd contends that here, where a primary purpose of the Project is to learn, it would be inappropriate to require, as a prerequisite for a finding of prudence and reasonableness, a cost-benefit analysis that ignores the value of learning by focusing only on immediate reliability benefits in the footprint.

However, ComEd asserts the impossibility of defining learnings and quantifying the value of those learnings in advance cannot require that a value of zero should be assigned to those learnings. Instead, ComEd contends the Commission can, and should, take a more nuanced approach that recognizes the significant value of the learnings the Project can generate. ComEd recommends that the Commission decline to require a forward-looking cost-benefit analysis as a prerequisite for a finding that the Project is prudent and reasonable.

ComEd explains that it will measure the direct and indirect impacts of the Project over the Project study period. ComEd asserts that, because the Project is the first urban, clustered microgrid of this scale, there are no industry norms or standard assumptions regarding costs and benefits. Therefore, ComEd states it developed a set of metrics based on existing industry best-practices, literature, and scholarly research. These metrics contain including 28 energy system resilience metrics, 15 community resilience metrics, and 13 critical infrastructure resilience metrics. Over the 10-year study period, ComEd will collect data on each metric, and will use that data to understand the types, and significance, of the Project's impacts. ComEd contends the metrics will ensure that all of the benefits of the Project are fully tracked, documented, and captured, and ComEd will report the results of the metrics to the Commission and stakeholders. ComEd argues that these metrics will allow ComEd to develop a cost-benefit framework that can be used to evaluate other opportunities to implement advanced distribution system technology, including microgrids.

ComEd states that the Commission should reject ELPC/Vote's argument that ComEd has not included sufficient metrics to assess the costs/benefits of its proposal. ComEd contends this statement ignores significant record evidence, and no party, including ELPC/Vote, suggested any additional or different metrics, or a different methodology for measuring and evaluating the impacts of the Project. Moreover, ComEd notes that Staff, Direct, and ICEA each took no issue with ComEd's proposal to conduct a cost-benefit analysis using data gathered as the Project goes into service and becomes operational.

ComEd asserts that, similarly, the Commission should reject the AG's argument that ComEd should have conducted a cost-benefit analysis, based on testimony indicating that ELPC/Vote witness Moretton has performed cost-benefit analyses of other microgrids. ComEd contends this argument makes little sense because the fact that Mr. Moretton claimed he could conduct a cost-benefit analysis of an operating microgrid (whose purpose is providing backup supply for a single customer or campus for example) says nothing about ComEd's ability to quantify before the fact the benefits of a utility-scale demonstration project. ComEd states it thoroughly explained why it has chosen to develop a cost-benefit model and analysis over the life of the Project. ComEd asserts the AG's criticism on this point ignores the record. ComEd states the industry is still learning about how and where microgrids can be installed, the circumstances in which they generate benefits that outweigh the costs, and even all of the specific benefits microgrids can generate. ComEd explains that most existing cost-benefit models related to microgrids focus on selecting optimal DER, but are not designed for overall analysis of the costs or benefits of microgrids. But ComEd plans to study both direct and indirect benefits associated with microgrids, and the opportunity to learn from the Project is a primary benefit of the Project. ComEd asserts the value of the learnings the Project generates cannot be quantified in the type of forward-looking cost-benefit analysis the AG advocates, because it is not possible to identify in advance the precise learnings the Project will generate. The value of learnings is also not a component of the forward-looking cost-benefit analyses that ELPC/Vote witness Moretton discussed in his testimony. ComEd contends a traditional forward-looking cost-benefit analysis would simply exclude the value of learning from the calculus entirely.

2. AG's Position

The AG asks the Commission to reject ComEd's position that because its proposed project is the first of its kind, it is not possible "to develop a forward-looking cost-benefit analysis" at this time; that it developed a set of metrics designed to measure the costs and benefits of the Project during the "study period" in order to perform a cost-benefit analysis at a later date; and that ComEd hopes that it will have sufficient data "to develop an initial cost-benefit analysis in 2020." The AG maintains that the Commission should not approve a project as prudent when the benefits will not be addressed for two years.

The AG notes that ComEd's claim that it is not able to perform a cost-benefit analysis of its Project was belied by ELPC/Vote witness Moretton. The AG cites the testimony of Mr. Moretton, who has conducted nine cost-benefit analyses for microgrid

projects in six states over the past three years. Mr. Moretton testified three of the projects he analyzed were canceled. ELPC/Vote Ex. 1.0 at 1. Mr. Moretton added that:

> Utilities frequently perform cost/benefit analysis on projects prior to moving projects from conceptual design to design phase. When costs for a technology are not well understood by a utility, a Request for Information, or Request for Quotation, is issued to the market. Utilities evaluate responses from vendors and providers to improve their cost estimates. Benefits are often quantifiable based on industry data. For microgrids, various cost benefit tools exist in the marketplace as mentioned by ComEd Ex. 3.0. There is no indication in the testimony that ComEd ran this project through these existing tools to identify cost/benefit. Nor does the testimony indicate ComEd used IIT's cost/benefit approach outlined in Perfect Power Prototype for IIT - Final Technical Report, Dec. 29, 2014.

Id. at 7.

AG witness Dr. Selwyn agreed that not only is it possible to conduct a cost-benefit analysis, but "the Commission should affirmatively require that such a study be presented as a threshold condition even for its consideration, let alone for its approval, of the Company's proposal." The AG asserts that the Commission cannot determine whether ComEd's request is prudent or reasonable unless it knows whether the project's benefits outweigh its costs.

The AG cites Dr. Selwyn analysis of the costs and benefits of ComEd's proposed microgrid, including that "[t]he benefits of any microgrid are inherently local – they are limited to those customers directly connected to the microgrid itself, and it is these local and specific direct benefits that need to be evaluated vis-à-vis the costs of the project." The AG maintains that a proper cost-benefit study would analyze the benefits and costs of the projects for the customers who would directly benefit from the Project – the 1,060 customers in the project's footprint.

In response to ComEd's claims that customers outside the Bronzeville area will enjoy the "learnings" derived from the project, the AG notes that if all customers are to benefit from the "learnings," the project would have to be an initial step in the 'roll out' of similar projects on ComEd's system over time. The AG presents Dr. Selwyn's calculation of the revenue impact of installing similar microgrids across the ComEd service area and concluded that such an endeavor would cost approximately $110 billion, or $11 billion if only 10% of ComEd's service area were covered. In response to ComEd's criticism of Dr. Selwyn's calculations, the AG points out that even if Dr. Selwyn's calculation were overstated by a factor of two, it would cost $55 billion to install microgrids throughout ComEd's service area and $5.5 billion to construct them in 10% of the service territory. The AG believes that investments of that magnitude are prohibitively expensive.

In response to ComEd's rebuttal claim that it "has not proposed any additional microgrids, in this proceeding or any other, and has no plan to eventually overlay its entire distribution system with microgrids" the AG notes the inconsistency of that claim with

ComEd's initial arguments that the Project is necessary to provide "learnings" about how to overlay microgrids onto its distribution grid. Further, the AG notes that the "learnings" have no value to the customers outside of the Bronzeville microgrid area if ComEd's plans for ultimate microgrid deployment do not extend to its entire customer base, those areas and customers that will never see a microgrid deployed in their communities derive virtually no actual benefit from whatever 'learnings' arise from Bronzeville.

The AG asserts that the Commission should rely on the $388.03 per customer monthly rate impact for the 1,060 customers in the Bronzeville area in assessing the cost and benefit of the Project. The AG compares this estimated cost to the Project's expected benefits as identified by ELPC/Vote witness Moretton. Mr. Moretton estimated that the cost savings associated with the reduction in interruptions due to the microgrid would range from $88,000 to $112,000 per year. ELPC/Vote Ex. 1.0 at 11. Dr. Selwyn calculated that while paying an additional $388.03 per month, Bronzeville customers would realize $6.45 to $8.81 in monthly savings. The AG calculates a cost-benefit ratio of 0.0166 to 0.0227. AG Ex. 2.0 at 23-24, Table R2. As Dr. Selwyn concluded in his direct testimony, "it is inconceivable that [the benefits of the project] could even remotely approach the [$388.03] increase in the average per-customer monthly electric bill that would result if the costs of the microgrid were recovered solely from those receiving direct benefits from it."

The AG maintains that while ComEd declined to offer a cost-benefit analysis to justify the $25 million expenditure it has presented, AG witness Selwyn presented the most basic cost-benefit analysis that unequivocally demonstrates that it would be impossible to identify enough benefits to equal or exceed the extremely high per-customer cost resulting from the microgrid project. Even if the $25 million in cost is compared to the reliability savings ELPC/Vote witness Moretton identified -- $88,000 to $112,000 per year -- the $5.3 million annual revenue requirement calculated by Dr. Selwyn demonstrates that the Project is not cost-effective. ComEd's effort to avoid review of the cost-effectiveness of its proposal by simply arguing that no cost-benefit analysis is possible and that the Commission should rely on future "learnings" should be rejected. The AG concludes that the Commission should find that ComEd has failed to meet it burden to prove that its proposal is cost-effective and it therefore cannot find the project prudent.

3. Staff's Position

Staff states that the Commission's finding of whether the Project is prudent should be based on the Commission's evaluation of whether the Project's projected benefits are greater than its projected costs. Staff Ex. 1.0 at 5. Staff notes that ComEd proposes to recover its costs to install and run the microgrid under its formula rate mechanism. ComEd Ex. 5.0 at 3. Those costs are socialized and recovered from all ComEd ratepayers, not just customers that are within the Project area and presumably benefit from the microgrid. Id. Staff continues that the statute does not mandate that ComEd make this investment, and the Project is not required to meet any existing standards for reliability. Thus, ComEd is not imprudent if it does not build the microgrid. No statutory or regulatory requirement or technical reason requires ComEd to construct the microgrid. Staff emphasizes that if the value that the microgrid generates through benefits to its

customers is less than what those customers are required to pay to defray ComEd's costs of construction, customers may incur costs that exceed the benefits they receive from the Project. In this way, the costs for this project can only be prudent if the microgrid's benefits exceed its costs. Staff Ex. 1.0 at 5-6.

Staff finds that Phase I of the Project is cost-beneficial. As previously noted, the cost to ratepayers is relatively low, while the purported learnings by the Company appear to be valuable. Staff reasons that in addition to those contributions made by the federal government and partners toward funding of Phase I, installation of DER is likely to increase, so determining how to balance distributed generation with load in a microgrid seems to be a worthy investment. Id. at 6.

Staff stresses, however, that the benefits of Phase II are less certain. According to ComEd, "learnings" are the primary benefit from the Project. ComEd 10.0 at 4. ComEd uses "learnings" to mean the lessons that ComEd will derive by balancing the microgrid's consumption of electricity with its generation in island mode. Staff Ex 1.0 at 6. However, ComEd has not provided sufficient evidence to conclude that the expected benefits associated with Phase II of the Project will exceed expected costs. Id. In fact, ComEd witnesses Avendano and Masiello state that the learnings are not quantifiable. ComEd Ex. 10.0 at 4. Staff notes that the incremental learnings of Phase II relative to Staff's modified Phase I are merely attributable to the larger footprint of Phase II.

Staff also submits that there is a legitimate question of market demand for "utility-scale" microgrids. In other words, it is unclear how many third parties will want to install a microgrid as large (in terms of load and number of customers) as the Phase II Bronzeville microgrid. For example, the microgrid installed by Ameren includes 1,475 kW of leased generation and batteries compared to the Bronzeville microgrid load equal to seven or eight MW. The smaller the market for larger microgrids, the less valuable are any incremental learnings from ComEd's Phase II, relative to Staff's proposed modified Phase I. Id. at 4-5.

Staff finds as well that ComEd's assertion that a cost benefit analysis is not the proper standard to evaluate prudence in this case is simply wrong. It is well established that "a just and reasonable [utility] rate can never exceed - perhaps can rarely equal - the value of the service to the consumer … [.]" State Public Utilities Comm'n v. Springfield Gas & Electric Co., 209 Ill. 209, 216 (1919); Citizens Utility Bd. v. Ill. Commerce Comm'n, 276 Ill. App. 3d 730, 737 (3d Dist. 1995) (citing the proposition favorably). The "value of the service to the consumer" is, in the case of this microgrid, the benefit that the customer will receive from its construction. Staff states, however, almost no customers (as a tiny percentage of customers are within the Bronzeville footprint) will obtain any direct benefit from this microgrid. Staff highlights that ComEd has made no attempt, and professes to be unable, to estimate any benefits to these non-Bronzeville customers – however indirect those benefits may be.

Staff notes that ComEd argues that certain types of investments are deemed prudent without reference to costs and benefits, specifically investments made by a utility "driven by some combination of safety, reliability, and convenience[.]" What ComEd ignores in advancing this assertion is exactly what Dr. Rearden made clear in his testimony – that such investments are, unlike the microgrid, required by statute. Staff Ex.

1.0 at 5; 220 ILCS 5/8-101 ("[a] public utility shall furnish, provide, and maintain such service instrumentalities, equipment, and facilities as shall promote the safety, health, comfort, and convenience of its patrons"). The benefit to ratepayers of safe, reliable, convenient service is so apparent that it is required by law, and since utilities are required to make investments necessary to provide such service, such investments are not subject – as Dr. Rearden made clear – to cost / benefit analysis in determining prudence. Staff Ex. 1.0 at 5. Staff reasons where, as here, a facility offers no benefit to the great majority of ratepayers, is not required by statute, cannot be shown to "promote the safety, health, comfort, and convenience" of customers, and benefits customers only to the extent of "learnings," it is incumbent on the utility proposing such investment to – at the very least – attempt to estimate the value of such "learnings." Yet ComEd has declined to do so. Staff surmises without a demonstration that Phase I will actually do what it is expected to do, Phase II is not prudent.

Staff continues that it is well-settled that a contemplated investment is not prudent if a less costly option is available. *See, e.g.*, 220 ILCS 5/8-406(b) (the Commission cannot grant a Certificate of Public Convenience and Necessity authorizing a utility to construct new facilities unless the utility demonstrates that the facilities are "necessary to provide adequate, reliable, and efficient service to [the utility's] customers and [are] the least-cost means of satisfying the service needs of its customers[.]") As Mr. Rockrohr observes, "[i]f a contemplated investment is not needed to provide service to customers or if there is a need but a less costly option to satisfy the need is evident, … the investment is not prudent." Staff Ex. 2.0 at 6. Staff maintains that ComEd's service to Bronzeville is adequate and reliable already. Id. at 7. Accordingly, the Company has to demonstrate some net benefit to customers, which ComEd has not done. Moreover, Staff states that it has proposed a lower-cost option calculated to accomplish the same objectives.

Staff adds that ComEd relies on Ill. Power Co. to support the proposition that a cost-benefit analysis is not a prerequisite for a finding of prudence and reasonableness. Staff finds that this assertion is more than Ill. Power Co. will bear. The Ill. Power Co. Court found that the Commission erred in determining that retirement of a propane plant by a utility was imprudent without the utility first conducting a so-called "present value of revenue requirements" test, where the Commission had previously allowed the utility to retire four other propane plants without such a test. Ill. Power Co. at 439. The Court therefore considered the Commission's decision to require such a test to be improper hindsight review. Id. at 439-40. Staff claims, however, the Court assuredly did not find that an economic or cost-benefit analysis should not be considered. The Court noted that, in deciding to retire the plant, the utility considered:

> (1) the plant's age, (2) the plant's safety, (3) plant reliability concerns, (4) the need for significant expenditures on the facility for renovations and upgrades (immediately and in the future), (5) the growth and development trends in the [area near the plant], (6) the fact that [the plant] was [the utility's] last remaining propane plant, (7) the liability risk that the plant presented, and (8) the ability to replace the plant's capacity with an alternative that offered greater reliability, safety, flexibility, and convenience than the … propane plant.

Id. at 440. The Court also noted that the utility had studies and quantified the expenditures needed to upgrade the plant. Id. Staff states that in Ill. Power Co. the company conducted a prudent economic analysis. Staff submits that the decision cannot be read to support the proposition that future "learnings" is a sufficient justification for a $25 million capital project, before devices such as the MMC, which are necessary to the success of the project, have been fully tested.

Staff concludes that the Commission has a duty to balance the needs and interests of both utilities and consumers. The duty inherently considers economic interests. Moreover, utilities have a duty to provide least-cost service. Staff states that it has presented a least-cost alternative to the Project, which ComEd has admitted will provide most of the learnings they seek to find in Phase II. Staff submits that its proposal should be implemented.

4. ELPC/Vote's Position

ELPC/Vote witness Moretton addresses ComEd's failure to include a cost benefit analysis head on by analyzing the costs of the project compared to the savings:

> The reliability benefit, using the LBNL data and DOE ICE Calculator, shows that the value of reducing the 43 minutes of annual downtime to near zero is between $82,000 and $112,000 per year for the Bronzeville microgrid. There are public safety benefits for having a microgrid, but given that the Chicago Police Department already has a backup generator and other facilities in the microgrid would not typically be classified as critical, it is hard to justify the microgrid as a critical infrastructure project. In fact, ComEd characterizes it as a "neighborhood" microgrid, not a critical infrastructure microgrid. ComEd asserts that learning is a key element, and talks about the connectivity with the IIT microgrid as a novel concept. Princeton University, however, has two connected microgrids today. These collocated microgrids already exist at a university where research into relationship of microgrids is studied. Therefore, using the ComEd testimony provided, it is unclear how the research benefits and resiliency improvements would justify the cost of this proposed microgrid design.

ELPC/Vote Ex. 1.0 at 14. Staff witness Rockrohr takes a different approach, but similarly concludes that the costs far outweigh the benefits.

ELPC/Vote assert that while ComEd makes arguments about the value of "learnings" throughout its testimony, that argument has no merit. The knowledge we gain from doing a microgrid in the right location that includes new DER technologies will provide immediate financial benefit, as well as better information for future projects. ELPC/Vote note that while we cannot place a real financial value on grid security, we need grid security in well thought out locations where the microgrids will benefit the

thousands of people outside the microgrid. Mr. Rockrohr notes the difficulty of assessing the value of "learnings" and emphasizes the shortcomings in Phase II:

> However, the Commission, in its evaluation of whether to approve or deny a Phase 2 expansion, should weigh the absence of a generally-accepted methodology against the incremental costs to ratepayers for unidentified potential learnings. In my view, it remains unclear that the purported incremental learnings associated with a Phase 2 expansion warrant the estimated $12 million additional cost to ratepayers at this time. My opinion remains that ComEd has not demonstrated that such an expansion at this time would be prudent.

Staff Ex. 5.0 at 4. ELPC/Vote add that Dr. Rearden reaches a similar conclusion, explaining:

> [T]he Company can learn from Phase 1, without costly Phase 2…In my opinion, the Project's Phase 1, bolstered by the clustering with the IIT microgrid, is cost-beneficial. Because the cost is relatively low as compared to the learnings that ComEd is likely to glean from the Project. Finally, I argued that Phase 2 was not obviously prudent, since the benefits are much less certain, while the costs are much higher.

Staff Ex. 4.0 at 3.

ELPC/Vote submit that ComEd's sister company Baltimore Gas and Electric Company attempted to justify an expensive microgrid project in Maryland based largely on "learnings" without including sufficient metrics to assess the costs/benefits of the proposal. The Maryland PSC determined that Baltimore Gas and Electric Company's failure to design the pilot to produce more meaningful information was fatal:

> Although BGE presents the Proposal as a pilot study for the purpose of gathering information and incorporating "lessons learned" to advance public purpose microgrid development in Maryland, the Proposal does not include any tangible metrics by which performance, let alone success of the project, may be evaluated. It is unclear how this study will be used specifically for the greater advancement of public purpose microgrids in Maryland.

Baltimore Gas And Electric Co., Case No. 9416, Order No. 87669 at 17. ELPC/Vote find that the exact same thing can be said of ComEd's proposal here. As Staff's conclusions indicate, the limited benefits in Phase II do not justify the costs.

5. Commission Analysis and Conclusion

As discussed fully in Sections IV. A, B, C and D above, the Commission finds ComEd's proposed Phase I and Phase II are prudent and reasonable. The Commission agrees with ComEd that Ill. Power Co. does not require a specific cost-benefit analysis,

and that ComEd has detailed the learnings it hopes to glean from the Project. The Commission notes that ComEd developed a set of metrics based on existing industry best-practices, literature, and scholarly research. These metrics include 28 energy system resilience metrics, 15 community resilience metrics, and 13 critical infrastructure resilience metrics. ComEd will collect data on each specific metric, and will use that data to understand the types, and significance, of the Project's impacts. Then, the Commission notes that ComEd will report the results of the metrics to the Commission and stakeholders. The Commission agrees with ComEd that these metrics will allow ComEd to develop a cost-benefit framework that can be used to evaluate other opportunities to implement advanced distribution system technology, including microgrids.

V. FUNCTIONALIZATION AND COST RECOVERY

A. Functionalization of Project Assets and Cost

1. ComEd's Position

ComEd states that the Commission should determine that the Project assets and costs serve distribution functions and the evidence supports no other conclusion. ComEd explains that assets and costs must be functionalized in order to determine not only the account(s) in which the assets or costs should be booked, but also which regulatory agency or agencies have jurisdiction over the assets and their operations, and how the costs affect, and are recovered in, rates. ComEd states electric system assets may be functionalized as distribution, transmission, or production. ComEd contends functionalization is a question of engineering and operations: functionalization is performed by looking at the function an asset is planned to, and actually does, perform, not simply the descriptive type of asset.

ComEd states the Commission has approved functionalization of assets and costs using FERC's "Seven Factor Test," which embodies the notion that functionalization is not just a matter of the type or size of an asset. ComEd explains that an asset or cost need not be functionalized entirely as serving a single purpose: both Illinois and federal law recognize that an individual asset can provide several services with different functions.

Under these standards, ComEd asserts that the entire project, including wires, control elements, storage, and the DERs and DER costs supporting the microgrid, should be functionalized as distribution, because the assets and costs support distribution functions. ComEd explains that the Project supports and is controlled by the distribution function. The Project is not designed to supply new or larger load but to keep power flowing to customers within the microgrid area during delivery system contingencies.

ComEd notes that, in other circumstances, DER generating equipment could be functionalized as production. But ComEd asserts the critical question concerns the function of the assets, and ComEd explains that the Project DER supports distribution rather than production functions. ComEd states the Project DER will not be used to make retail or wholesale sales, will not serve additional load, and will not provide capacity to serve additional load, as production function assets do. Rather, ComEd explains Project

DER will be utilized when the microgrid is islanded, and for testing and maintenance purposes, and the Project DER output will be consumed within the restricted geographic footprint of the microgrid, and will not be transported to other areas of the system. In addition, ComEd states it will procure only the right to utilize third-party-owned non-storage DER for Project purposes and third-party non-storage DER owners will be free to utilize the assets for other purposes at all other times. Therefore, ComEd explains that the only costs ComEd will incur with respect to Project DER will be for the portion of the assets that provides distribution service, and the full cost to ComEd of procuring third-party-owned non-storage DER for Project purposes should be functionalized as distribution.

ComEd argues that the AG gave no reason for its assertion that the Commission should refrain from making functionalization determinations, particularly regarding Project DER, until investments are made. ComEd contends that the terms of the contracts or leases for Project non-storage DER do not relate to the function those non-storage DER will perform in the Project. Rather, functionalization is a question of engineering and operations; assets are functionalized according to the functions they perform. ComEd maintains that since the Project is designed to keep power flowing to customers within the microgrid area during system contingencies, rather than to supply new or larger load, it is most accurately functionalized as distribution. According to ComEd, no matter what the terms of the non-storage DER procurement are, the DER will be utilized to support the Project's distribution purposes. ComEd also expects to procure only the distribution functionality of the assets, to support the distribution purposes of the Project as a whole. ComEd submits that the Project DER should be functionalized as distribution.

2. AG's Position

The AG questions whether the Commission can conclude that the costs associated with the Project are "delivery services costs subject to examination in future delivery formula rate update proceedings" or whether the investment is prudent and reasonable before the investments are actually made and before many of the decisions associated with the Project are made. In particular, the appropriate functionalization of energy resources in the microgrid, or DER, can only be assessed when the terms governing their use is established. The AG asserts that ComEd – not ratepayers – should assume the risk of investing in a project that the evidence shows lacks clear definition, cost forecasts and "learnings" potential.

The AG notes that ComEd witness Naumann testified that "even identical assets may be functionalized differently," depending on the function they provide. ComEd Ex. 13.0 at 4. He emphasized that "it is important that assets be characterized according to the function they perform for the electrical system." Id. at 4. In order to determine the correct functionalization, one must look "at the primary function of the asset." Id. at 7. Notwithstanding the substantial uncertainty about how and on what terms energy resources for the project will be procured, ComEd witness Naumann opined that the "entire microgrid system, including… integrated DERs, should be functionalized as distribution." Id. at 10.

The AG cites the definition of delivery services that are subject to formula rates, as:

> those services provided by the electric utility that are necessary in order for the transmission and distribution systems to function so that retail customers located in the electric utility's service area can receive electric power and energy from suppliers other than the electric utility, and shall include, without limitation, standard metering and billing services.

220 ILCS 5/16-102. The AG emphasizes that the terms of the contracts or leases whereby ComEd will obtain DER for the project are unknown, and therefore it is premature for Mr. Naumann to purport to determine what function, other than generating energy supply, the project energy resources will perform. The AG maintains that the only thing certain today is that the microgrid energy resources would provide energy to the microgrid area that ComEd can then deliver, and that there will be testing.

In response to ComEd's citation to Section 16-108(c) of the PUA, which addresses when the costs of generation facilities can be included in distribution rates, the AG notes that Section 16-108(c) includes specific conditions that ComEd did not address. The AG states that ComEd does not allege that the DER is "used for the production and absorption of reactive power," nor does ComEd define reactive power, another use of generation that may be functionalized as distribution. Further, ComEd has not demonstrated that DER will be used and re-dispatched "to mitigate constraints on the transmission or distribution system in order that retail customers located in the electric utility's service area can receive electric power and energy from suppliers other than the electric utility" as required by the statute. In short, the AG argues that ComEd did not show that the Project DER qualifies to be functionalized as distribution under Section 16-108(c).

The AG further explains that in island mode, ComEd will have procured "the right to utilize third-party-owned DER for Project purposes" and so customers will not be able to receive "electric power and energy from suppliers other than the electric utility" from outside the microgrid as required by Section 16-108(c). The AG notes that when in island mode, microgrid customers will be cut off from the broader grid and will not be able to receive power from any generator other than the Project DER. The AG maintains that when the utility procures electric power and energy for consumers it is not performing a delivery function as defined in Section 16-108(c).

The AG asks the Commission to reject ComEd's essentially bald assertion that DER provide a distribution function because the utility can deliver those energy resources within the microgrid in island mode. The AG asserts that the Commission should not functionalize all DER costs without more specificity demonstrating that the allocated DER functions fall within the requirements of Section 16-108(c) cited by ComEd. The AG states that the plain reality is that the Project DER is utilized precisely to produce electric power and energy for consumers within the microgrid – regardless of whether that DER is procured by ComEd, owned by ComEd, or leased by ComEd. The Commission should not find that Project DER is a distribution asset until the terms of ownership and the uses of the DER are presented for review and the appropriate portion of the cost can be assessed as distribution or production.

The AG notes that internal project energy resources are necessary only when the microgrid is islanded and only because ComEd cannot or will not use its general distribution system to supply the area with electricity. The AG states that generation assets remain generation assets: they produce the electricity that ComEd can deliver or distribute within the microgrid area when its connection to outside energy resources is lost. The AG rejects the notion that energy resources somehow perform a "distribution" function and assert that they simply provide the product (energy) that ComEd can distribute, albeit in a relatively tiny area.

The AG asks the Commission to refrain from making any commitment on how it will treat costs related to energy resources until the costs and all the terms of operation are presented to the Commission for review. At that point, the actual cost, the actual function of the energy resource in relation to the microgrid and to ComEd's overall system, and how the total cost should be allocated between ComEd and the owners of the resource will be known. The AG asserts that before then, it is unwise and speculative to make fundamental decisions about the appropriate functionalization of microgrid energy resources and assets.

3. Staff's Position

Staff witness Rearden concludes that the cost of generation investments owned by third parties and leased by ComEd, as well as other expenditures on its Project, be recorded as distribution costs. Staff Ex. 4.0 at 1. Accordingly, the prudence review and subsequent recovery of approved costs related to the Project should occur in the context of the Company's applicable annual formula rate update case, as proposed by ComEd. Additionally, Staff witness Rockrohr submits that revenues from DER from the Project may be recorded as a reduction of unaccounted for energy ("UFE") costs, as proposed by ComEd, given ComEd's commitment to exclude Project DER energy offsets when calculating performance relative to its annual UFE performance metrics goal, pursuant to Section 16-108.5 of the Act. Staff Ex. 5.0 at 6.

Staff agrees that the Project DER energy may be treated as an offset to UFE following: (1) ComEd's commitment to exclude these UFE offsets when calculating performance relative to its annual UFE metric goals pursuant to Section 16-108.5 of the Act; and (2) ComEd's assurance that the Company does not seek to establish a precedent in this proceeding regarding how DER energy would be treated in future microgrid deployments. ComEd Ex. 12.0 at 8.

Though not relevant to the Commission's decision in this proceeding, Staff does not fully agree with ComEd's assertion that Project DER will reduce the total load requirement within the ComEd zone. ComEd's assertion could be interpreted to mean that Project DER will result in reduced customer loads. Staff argues that this is not the case. Any reduction in required supply to the ComEd zone attributable to the Project would be due to the addition of generation supply - not due to reductions in customer loads. Since ComEd does not plan to reduce procurements by an amount equal to the output of the Project DER, the contemplated energy supplied by Project DER would be a duplicate energy source for those customers connected to the microgrid. Staff Ex. 5.0 at 7. If the energy produced by Project DER were not in addition to energy purchases already in place, there would be no "extra" energy within the ComEd zone available during

microgrid islanding to offset UFE. Id. Staff further disagrees with ComEd's claimed potential problems associated with treating Project DER output as a reduction to company use energy rather than as an offset to UFE. Staff Ex. 2.0 at 14-15.

Staff acknowledges that because it agrees that ComEd may treat Project DER output during islanding as an offset to UFE for its demonstration microgrid, the above stated disagreements are not relevant to the Commission's decision.

4. ICEA's Position

ICEA suggests that the Commission review its arguments in Section III.D above regarding competitive bidding of storage DER. In addition, ICEA highlights the following exchange in the surrebuttal testimony of ComEd witness Mr. Svachula:

> Q. Mr. Wright states he assumes that "ComEd is not arguing that the entire distributed generation asset (or even storage asset) should be functionalized as distribution." ICEA Ex. 2.0, 6:130-131. Is that assumption correct?
>
> A. Mr. Wright is correct that for purposes of the Project, ComEd will seek to purchase from third parties only the distribution portion of the DER value stack. Given that ComEd will not own the DER, there is no issue as to how ComEd might functionalize the entire asset.

ComEd Ex. 15.0 at 10. ICEA also highlights a passage from the testimony of ComEd witness Mr. Naumann:

> As discussed in Mr. Svachula's testimonies, ComEd plans to seek out contracts with third-party DER owners that provide ComEd with DER output when necessary for the Project's distribution purposes. In that scenario, the third-party DER owner could use any output that is not subject to the contract with ComEd to participate in wholesale markets, if they choose to. Mr. Barbeau's claim that recognizing the distribution function of ComEd use somehow precludes the third-party owner from using other features of the asset for other purposes is simply incorrect. Regardless of how other attributes of third-party owned DER are used, ComEd's utilization of the DER would be specific to the Project's distribution purposes, and ComEd's cost of obtaining those rights to the DER would be properly functionalized as distribution.

ComEd Ex. 13.0 at 13. ICEA argues that the same reasoning for functionalizing generation DER should also be applied to storage DER. ICEA witness Mr. Wright concluded:

> I am not an expert on functionalization, but I am persuaded by Mr. Naumann's testimony that storage has both generation and distribution (as well as potentially transmission) functions.

> . . . If the Commission accepts my suggestion that ComEd competitively bid microgrid storage assets, I would expect ComEd to be bidding out relatively more distribution-related services (at least as a percentage of asset value, relative to distributed generation). Nothing in Mr. Naumann's testimony changed my opinion that storage should be competitively bid and owned/operated by third parties.

Id. at 9 (two responses combined for clarity).

5. Commission Analysis and Conclusion

The Commission agrees with ComEd's position, supported by Staff, that the cost of generation investments owned by third parties and leased by ComEd, as well as other expenditures on its Project, be recorded as distribution costs. The Commission finds that the Project DER will not be used to make retail or wholesale sales, will not serve additional load, and will not provide capacity to serve additional load, as production function assets do; therefore, it should be functionalized as distribution. The Commission disagrees with the AG that it must wait to determine functionalization, since the functions of the assets and costs are already apparent. Further, the Commission agrees with Staff that revenues from DER from the Project may be recorded as a reduction of UFE following: (1) ComEd's commitment to exclude these UFE offsets when calculating performance relative to its annual UFE metric goals pursuant to Section 16-108.5 of the Act; and (2) ComEd's assurance that the Company does not seek to establish, and the Commission is not establishing, a precedent in this proceeding regarding how DER energy would be treated in future microgrid deployments.

B. Recovery of Project Costs in Delivery Rates

1. ComEd's Position

ComEd seeks a Commission finding that Project costs are properly recoverable in formula delivery rates. ComEd states that Project costs are properly functionalized as distribution, will be recorded in distribution accounts that provide source data for ComEd distribution formula rates, and will be treated like all other delivery service costs in those accounts for ratemaking purposes. ComEd states that the costs of acquiring assets used for the Project, including depreciation expense and deferred taxes, and operating and maintenance costs, will be included in rates, net of accumulated depreciation and any return of capital. ComEd contends it is proper to recover Project costs like other delivery services because the Project provides delivery services.

ComEd notes that it has not requested Commission approval for any particular expenditure associated with the Project. ComEd states the Commission will have an opportunity to review the prudence and reasonableness of actual expenditures and investments in each annual formula rate update, as they are made. ComEd does not oppose the accounting recommendations of Staff witness Pearce.

ComEd highlights that no party has provided an accounting rationale for recovering Project costs outside delivery rates, or testified regarding any alternative recovery mechanism.

2. AG's Position

In evaluating ComEd's request that the entire cost of the project be treated as distribution costs that can be recovered in ComEd's annual formula rate review process, the AG directs the Commission to the terms of the PUA, which defines distribution or delivery services as:

> those services provided by the electric utility that are necessary in order for the transmission and distribution systems to function so that retail customers located in the electric utility's service area can receive electric power and energy from suppliers other than the electric utility, and shall include, without limitation, standard metering and billing services.

220 ILCS 5/16-102. Based on this definition, the AG asserts that the energy resources, or DER in the project, should not be treated as distribution resources in the formula rate reviews.

The AG further emphasizes that ComEd is currently in the midst of a major investment plan to modernize its distribution system to improve reliability and system operation. In 2012, the General Assembly adopted legislation authorizing ComEd to invest $2.6 billion in distribution infrastructure modernization through 2022. 220 ILCS 5/16-108.5(b)(1)(A). Much of that investment was expected to reduce the number and duration of outages and so improve both reliability and resiliency by upgrading and modernizing existing infrastructure, utilizing distribution automation and other "smart" technologies and "reducing the susceptibility of certain circuits to storm-related damage, including but not limited to, high winds, thunderstorms and ice storms." See 220 ILCS 5/16-108.5(b)(1)(A)(iv). The AG submitted an excerpt of ComEd's 2016 Annual Report on its infrastructure investments (dated March 31, 2017), which describes the benefits of its recent $242 million DA investment. AG Cross Ex. 4. The AG submits that these ongoing upgrades provide similar if not identical protection to customers as the more expensive and limited microgrid, and enable ComEd to continue to deliver electricity to customers "provided the substation continues to receive power through the transmission and distribution grids." AG Cross Ex. 8. The AG explains that DA minimizes the extent of outages through sectionalization and rerouting whether the outage is caused by large-scale storms or by local problems such as vegetation or even animals. The AG notes that while the microgrid can provide power when all connection to substations and transmission services is lost and islanding becomes necessary, that is an exceedingly rare situation. In fact, ComEd witnesses were not able to identify any prior outages where islanding would have been appropriate, and declined to estimate how often islanding can be expected. The AG expresses concern that it is possible that there could be no islanding events in the ten year study period ComEd proposes.

The AG also states that the Project area is already served by two substations and two full feeders and that if there is an outage on one feeder, "then the additional path(s) or loop(s) would provide each customer within the microgrid area alternative paths for the delivery of power." ComEd's ongoing investment in its distribution infrastructure, and more specifically in distribution automation already improves reliability and resilience

(rapid recovery of a power source) by rerouting power within the distribution system without the need to duplicate energy resources. By contrast, the microgrid proposal includes $14.7 million for duplicative generation. The AG questions whether that expenditure will add reliability or resilience to microgrid customers given the existing redundancies in its system and the extremely low probability that the area will ever be cut off from the ComEd system and have to operate in island mode.

The AG concludes that the Commission must match the costs of the Project with the benefits of the Project in order to understand the scope of benefits necessary to justify the Project as prudent and reasonable. The Commission should decline to find the Project prudent and reasonable at this time and decline to address whether ComEd can collect the cost of the Project from all ComEd customers. The AG maintains that there is simply not sufficient evidence in the record to support such a finding.

3. Staff's Position

Since the Project costs will need to be evaluated for prudence and reasonableness in a future rate case, Staff witness Pearce recommends the following:

(1) The Commission should order ComEd to use separate, distinct project identifiers in its general ledger system to record the microgrid demonstration costs for tracking purposes;

(2) The Commission should order ComEd to record the costs noted in Recommendation (1) above separately for each phase of the proposed microgrid demonstration;

(3) The Commission should direct ComEd to record the leased DER investments in the microgrid demonstration as distribution costs;

(4) The Commission should direct ComEd to record any revenues from DER in the microgrid demonstration as an offset to UFE; and

(5) The Final Order in this proceeding should state that the prudence and reasonableness of costs incurred for each phase of the microgrid demonstration project will be determined by the Commission in a future rate case and based on supporting documentation provided at that time.

Staff states that these recommendations are limited to the instant proceeding and should not be relied upon for precedential value in any other proceeding.

4. Commission Analysis and Conclusion

The Commission agrees with ComEd that any costs resulting from the Project are recoverable in delivery rates. The Commission also agrees that any particular expenditures would be litigated in future formula rate cases. Finally, the Commission approves Staff's five accounting recommendations, to which ComEd also agrees.

C. Rate Design Issues

1. ComEd's Position

ComEd proposes to recover the costs of the Project in rates charged to all customers according to the Commission's approved rate design, as the benefits of the Project will accrue generally and as its purpose is to advance the overall state of delivery system design, operation, reliability, and resiliency.

ComEd explains this treatment is appropriate because the benefits of the Project inure to all customers, and the Project will produce learnings that will benefit the entire service community, and resiliency benefits that extend far beyond the Project footprint. ComEd states that this treatment is consistent with the cost recovery approach for past pilot programs, where the Commission has not required that the costs associated with new technology be recovered from only those customers who happen to be located in areas of the system where the technologies are first implemented. ComEd notes that, although it is not possible to accurately calculate the impact the Project will have on customers' rates over its entire useful life, ComEd expects the impact to be *de minimis*.

ComEd states that the Commission should reject the AG's argument that ComEd has not indicated how it plans to allocate the cost among customer classes, or whether it plans to recover costs as a fixed or variable surcharge, or a variety of other cost-recovery methods. ComEd states its position has been consistent throughout this case: the costs of the Project will be recovered through formula rates in the same manner as other costs of primary distribution facilities of the analogous type. ComEd contends the AG's argument that the costs of the Project should not be spread among all ComEd customers is unfounded.

ComEd proposes to reflect the output of Project DER as an offset against UFE. ComEd argues that this provides a competitively-neutral benefit to all customers, is reasonable, and well-supported. When the Project is connected to the larger distribution system, ComEd intends to use the output of controllable DER only for study purposes and as necessary for maintenance and testing. In addition, the Project DER will not alter the amount of retail sales to customers in the ComEd zone; it will simply reduce the total load requirement within the zone. ComEd expects the Project's impact on UFE to be *de minimis*, but this proposal ensures that all customers, including those who are supplied by ComEd and those who are supplied by RESs, share equally in the reduction in the cost associated with UFE.

ComEd argues that proposals for Project DER to be recorded as a reduction to company use are inconsistent with the rules applicable to similar use of the delivery system by other parties under ComEd's tariffs, and could legally require ComEd to own all Project DER. ComEd argues that this is inappropriate for four reasons. First, ComEd states the output of Project non-storage DER that is owned by a third-party could not be viewed as ComEd's self-supply, such that it would be considered company use. Second, ComEd states the non-storage DER owner will be a third-party and, depending on the nature of the ComEd-owner agreement, if that output is treated as being injected by the third-party, it could not be used to supply ComEd end-use load without the third-party non-storage DER owner being certified as, or acting as, a RES. Third, ComEd states the

output of Project DER will not be delivered at a location where ComEd has load and it could not supply that load without using and travelling over the delivery system, and, further, ComEd's tariffs prohibit the use of customer-owned generation as a source of self-supply when generation is not at the customer's premises. Finally, ComEd states that offsetting Project DER output against UFE reflects the fact that Project DER will support public learnings that will benefit the entire community, not solely ComEd.

ComEd notes that its proposal to treat the output of Project DER as an offset against UFE is supported by Staff, in light of ComEd's commitment to exclude Project DER output from the UFE reduction metric under Section 16-108.5 of the Act. ComEd states no party supported a different treatment in briefs. ComEd concludes the Commission should find that offsetting the output of Project DER against UFE is reasonable.

2. AG's Position

The AG points out that ComEd has not indicated how it plans to allocate the cost among customer classes, or whether it plans to recover costs as a fixed or variable surcharge, an adder to the fixed monthly charge, an increase in the usage (kWh) rate, or in the demand charge paid by non-residential customers.

The only "rate design" issue presented in this case is ComEd's request to spread the cost of the $25 million Project over all of its 3.9 million customers, although only 1,060, or 0.027%, of its customers will receive the improved reliability and resilience the Project promises. Fundamental principles of preference, non-standard service, and cost causation discussed above dictate that the Commission allocate the cost of the Project to those who benefit. However, the AG notes that if the Commission finds that the cost of the Project is too great to charge the customers within the Project area who will benefit from it, ComEd is free to subsidize the Project with shareholder funds. The AG maintains that it is unreasonable and unfair to spread the cost to all customers simply to dilute the cost impact of a project that has not been shown to be cost-effective.

3. Staff's Position

Staff's position is stated in Section V. B. 3, above.

4. Commission Analysis and Conclusion

The Commission finds that the only rate design issue in this docket is whether the Project would be included in delivery rates for all customers. As discussed in Section V.B above, the Project affects delivery service, so it is appropriate to be included in delivery rates. As also stated below in Section VII. D., the Commission makes no findings regarding tariffs. The AG's concerns about how ComEd plans to allocate costs across customer classes is more appropriately evaluated in a future tariff filing.

VI. PROJECT IMPACTS ON RES AND RES' CUSTOMERS

A. ComEd's Position

ComEd seeks a Commission determination that the Project will not change the volume of ComEd's retail energy sales, will not impair customers' rights to select a qualified RES, and will not impair or increase the cost of providing competitive energy supply.

ComEd states that there is broad agreement among the parties that the Project will not restrict the supply options available to customers, nor will it impose additional costs or burdens on RESs or RES customers. In addition, ComEd notes customers within the Project footprint will continue to take delivery services and purchase energy from the supplier of their choice – on an individual basis or as part of an aggregation program – even when the microgrid is islanded and service would otherwise have been entirely interrupted. ComEd explains that this is possible because all retail electric sales are financial transactions, and customers' source of "physical" supply is determined by power flows across the grid. ComEd states it will continue to meter customers' energy use in the Project area, even when the Project is islanded, the metered usage will be reported as load to the customers' chosen suppliers, and the customers will pay the RES pursuant to the terms of the RES contract. Thus, ComEd explains, the Project will allow RESs to serve load within the Project area on the same, if not better, terms, since the microgrid will allow customers to continue consuming metered energy through an interruption that would disrupt service under other circumstances.

ComEd states the AG argues that the Project will distort the market for RESs and other entities that offer microgrids directly to customers because the Project will create an incentive for customers to seek utility-scale microgrids to avoid paying the cost of superior service that they determine they want but do not want to pay for. ComEd maintains these claims are unsubstantiated and bear no relation to the relief that ComEd has requested, which is limited to the Project.

ComEd states the Project is a demonstration project that is intended to study microgrid technology and benefits over a wide variety of customers, and to provide benefits to all customers in the form of learnings that drive efficient and reliable grid design in the future. If, in other, future, hypothetical circumstances, ComEd receives a request for a microgrid that would not benefit all customers, ComEd states that request would be handled differently than this Project. ComEd asserts the AG would have the Commission deny ComEd's requested finding – which relates only to the Project proposed here – based on conjecture about what might happen in an unrelated future circumstance. ComEd concludes the Commission should reject the AG's recommendation.

B. AG's Position

The AG points out that ComEd originally proposed that it would own generation or energy resources if it could not procure energy resources at a suitable cost. It now proposes to lease, rather than own, generation, if necessary. Regardless of whether ComEd plans to own, lease or otherwise contract for energy resources, it asks that its ratepayers cover the entire cost.

The AG expresses concern that ComEd ownership of microgrids and control of microgrid energy resources will distort the market for RESs and other entities that offer microgrids directly to customers. The AG argues that ComEd would have a significant competitive advantage over these competitors that must find customers willing to shoulder the entire microgrid cost and put their capital at risk, and pointed out that utility provision of microgrids will create an incentive for customers to seek utility-scale microgrids to avoid paying the cost of the superior service that they determine they want but do not want to pay for. The AG points to evidence of such requests in the letters attached to ComEd's Verified Petition as Amended Appendix I and is discussed above. The AG believes that this will undercut the cost-basis of private microgrids and distort customers' assessments of whether a microgrid is cost-effective for them.

The AG cites the testimony of Dr. Selwyn who pointed out:

> ComEd's proposal that the costs of these DER facilities be recovered through rates for its monopoly distribution services undermines at a very fundamental level the existing competitive electric supply policy that has been adopted in Illinois and in many other jurisdictions. In effect, ComEd would be permitted to build or lease generation to replicate 100% of the currently competitive generation capacity with small-scale facilities operating at lower levels of efficiency, and would be allowed to recover 100% of these costs from its monopoly distribution service customers as if that generation were distribution plant.

AG Ex. 1.0 at 77. The AG notes that even if ComEd does not intend to develop microgrids for its entire service area, allowing ComEd to charge all consumers for microgrids and then compete with private, non-utility RESs and microgrid developers in areas where microgrids might be appropriate will put the smaller competitors at a disadvantage and distort market opportunities and outcomes. The AG recommends that the Commission not approve the proposed microgrid project because it will have a negative effect on the private market for microgrids.

C. Staff's Position

Staff does not object to ComEd's proposal to bill customers for energy consumed during islanding as if they were connected to the larger grid. ComEd's plan will allow RES sales and billing to remain unaffected by ComEd's operation of the microgrid. Staff Ex. 2.0 at 11-12.

D. ICEA's Position

ICEA points to the testimony of its witness Mr. Wright, who agreed with ComEd's primary conclusions that the microgrid would not negatively impact RESs and RES customers. In addition, RESs may benefit from the Project learnings. ComEd witness Svachula testified that: "ComEd has agreed to provide data and learnings from this Project to all interested stakeholders." ICEA believes this will be a positive for the competitive retail market and ultimately customers of RESs.

E. Commission Analysis and Conclusion

The Commission agrees with ComEd, Staff and ICEA that RES sales and billing will remain unaffected by the Project. The Commission does not agree with the AG that a microgrid frustrates the competitive electric market. As ComEd points out, RES customers within the Project footprint are still able to choose an alternate supplier if they wish, and are billed for delivery services and supply by ComEd, and islanding will not affect customer choice. Moreover, as ICEA notes, RESs may benefit from Project learnings, and ComEd intends to circulate its findings to a broad range of stakeholders.

VII. PROJECT EXECUTION AND REPORTING

A. ComEd's Position

ComEd plans to submit several reports regarding the Project to facilitate information sharing with the Commission and stakeholders. In particular, ComEd has committed to submitting the following reports:

- Annual Report – ComEd will submit an annual report on the status of the Project, each year on the anniversary of the Commission order approving the Project. The annual report will describe the activities undertaken over the prior year and the activities to be undertaken in the upcoming year. The report will summarize any learnings to date, describe any revisions to the overall schedule or scope of the Project, and explain any other significant updates. ComEd anticipates submitting annual reports over the entire 10-year study period, after which ComEd expects the value of additional learnings from the Project will taper off. Nevertheless, ComEd will work with the Commission and stakeholders to determine whether additional reporting would be worthwhile.

- As explained in the Procurement Section of this Order, a special report (in confidential and public versions if necessary) to the Commission in the event that ComEd does not receive any qualified bid (or otherwise abandons the results of the procurement process for any reason).

- Phase I Report – The current timetable for the SHINES grant anticipates ComEd submitting a report to DOE at the end of 2019. ComEd will share that report with the Commission and stakeholders, if permitted to do so by the DOE. Otherwise, ComEd will prepare a separate report describing the development, operation, and learnings from Phase I. ComEd anticipates this report will be made in late 2019 or early 2020.

- Initial Metrics/Cost-Benefit Report – ComEd anticipates being able to collect and analyze sufficient data from the Project to develop an initial cost-benefit analysis in 2020. ComEd intends to report the results of that analysis to the Commission and stakeholders.

- Final Report – At the end of the study period, as adjusted in consultation with the Commission and stakeholders, ComEd will develop a comprehensive report describing the development, operation, and learnings from the full Project.

ComEd also proposes to certify to the Commission regarding the MMC before it proceeds with Phase II. If the Commission approves the Project as ComEd proposes, ComEd will submit a certification before proceeding to Phase II that: (i) the MMC operates satisfactorily and within design parameters, as determined through "power hardware in the loop" testing, which creates and simulates the feeder topology in Bronzeville; (ii) the Project at that point meets the minimum qualifications for receipt of funding under the SHINES grant; and (iii) includes a report on an applicable limited set of metrics. If the Commission approves a configuration for the Project that includes an interconnection with the IIT microgrid in Phase I, such as the configuration proposed by Staff, ComEd will submit a certification that: (i) the MMC is operating satisfactorily and within design parameters when controlling the ComEd microgrid and the interconnection with the IIT microgrid; (ii) the Project at that point meets the minimum qualifications for receipt of funding under the SHINES grant; and (iii) includes a report on an applicable limited set of metrics. ComEd proposes that either certification will be attested by an officer of ComEd, and will be filed in the Docket as a compliance status report.

If the Commission approves the Project as proposed, ComEd also commits to work in good faith with CUB/EDF to discuss and consider goals discussed in the testimony of CUB/EDF witness Barbeau, including how to enable the market for third-party microgrids, and to develop a pilot microgrid services tariff for filing with the Commission no later than January 1, 2020. ComEd and CUB/EDF agree that a pilot microgrid services tariff should reflect the following goals:

- Microgrids subject to the pilot tariff may be developed and operated by parties other than a utility as allowed by law (for example, provided that the microgrids are not used to provide regulated utility services to the public). Non-utility parties may also manage or own generation assets that are integrated with such a microgrid as allowed by law.

- Customers may, under the pilot tariff, request ComEd to conduct a feasibility study of a proposed microgrid serving requesting customers and analyze whether it is technically feasible without significant adverse impact to the delivery system and its reliability, resiliency, and efficiency, or the facilities or operations of any other customer. ComEd will estimate the incremental cost of services and facilities that exceed the costs of standard services and facilities (taking into account established rebates or incentives for which the customer is eligible).

- Services that are provided by the utility under such a pilot tariff may include, but are not limited to, those supported by utility equipment and facilities enabling islanding and by the utility's microgrid controller.

- ComEd is entitled to recover fully any actual cost of providing such services including a return of and on its investments, through charges paid by customers requesting such services or otherwise.

ComEd and CUB/EDF also recognize that the pilot tariff must comply with the Act, must not foreclose service offerings that ComEd may lawfully make available to customers or prevent customers from exercising their rights under law to take delivery service from ComEd or to purchase energy from qualified third-parties. ComEd also anticipates consulting with stakeholders in addition to CUB/EDF regarding the terms of the pilot tariff.

ComEd notes that Staff agrees that the certifications and reports that ComEd committed to make are appropriate, and that the AG, ELPC/Vote, ICEA, Direct did not address the certifications and reporting. ComEd concludes the Commission should approve these commitments as ComEd has proposed.

B. Staff's Position

Staff had initial concerns that approving Phase II of the Project prior to completion of Phase I was unreasonable because testing of the MMC occurs in Phase I. However, the Company commits to certify that the MMC is operating within design parameters prior to any potential expansion of the microgrid beyond the Phase I footprint. ComEd Ex. 7.0 at 32. More specifically, ComEd states that it will follow the applicable standardized testing procedures stated in IEEE Standard 2030.8 - Standard for the Testing of Microgrid Controllers to conduct any remaining testing for the MMC technology during Phase I. ComEd Ex. 9.0 at 14. According to the Company, IEEE Standard 2030.8 has been approved by the 2030.8 working group and was subject to final approval by the IEEE Standards Association in December 2017. Staff Cross Ex. 1.0 (Rev.) at 2. ComEd intends to adhere to that standard during its testing process and will compare the performance data collected during the testing against the metrics that will be specified in the final standard. ComEd will arrange for the Commission to have access to the Standard. Id. The Company adequately addresses Staff's concerns regarding testing and reporting of the MMC.

If ComEd's Project is approved by the Commission, ComEd proposed that the Commission set specific certifications for the Company before approval of Phase II, and provides, in particular, that one such certification will include a report on an applicable limited set of metrics. ComEd Ex. 7.0 at 31-32. ComEd intends to focus its reporting efforts on specific metrics that saw a change as a result of Phase I implementation, including a study of the impact of Phase I to all of the metrics that it has proposed to study (*see*, ComEd Ex. 3.01.). Staff Cross Ex. 1.0 (Rev.).

While Staff continues to recommend that a smaller, less costly microgrid defined by the Phase I footprint will provide ComEd with the majority of the potential learnings at far less cost to ratepayers, if the Commission approves the Project, the Commission should require ComEd to make the certifications, as proposed by the Company and prior to Phase II construction and implementation. Staff Ex. 5.0 at 5.

Staff notes that ComEd agrees to work with stakeholders to develop microgrid tariffs. CUB/EDF Cross Ex. 1. In Staff's view, the Commission should not consider this proposal when writing this Order. The issue was not litigated, there is no record to support it, and it is outside the scope of the petition, which began the docket. The issues involved in such a tariff are complex. There are consequences for cost incurrence and cost allocations, such as whether expenditures on multiple microgrids are prudent or which customers should pay for them. As such, the Commission should not decide any issues concerning tariffs in this docket. In particular, ComEd explains one goal of tariffs as "ComEd is entitled to recover fully any actual cost of the providing such services including a return of and on its investments, through charges paid by customers requesting such services or otherwise." Microgrids built pursuant to this tariff are going to be prudent projects. Staff adds while the statement does hint that the charges are to be paid by the requesting customers, it leaves open the possibility that microgrids in one area could be paid for by all ratepayers.

C. CUB/EDF's Position

CUB/EDF witness Barbeau testified that the Project provides an opportunity to address policy and regulatory questions around microgrids and recommended the development of a regulatory framework to enable customer-driven microgrids managed by parties other than the utility, that include generation assets owned and/or managed by non-utility parties. CUB/EDF Ex. 2.0 at 10. Mr. Barbeau proposed a number of considerations for such a framework:

- It should reflect and enable customer-driven microgrid scenarios, and provide guidance for both customers and the utility. CUB/EDF Ex. 2.0 at 11.
- It should provide an avenue for customers to request a microgrid and explore whether related services and facilities are reasonable and technically feasible. Id.
- A utility should be able to evaluate whether the customer's request can be met with no significant adverse impact on the utility's system with respect to reliability and efficiency. Id.
- It should encompass services provided by the utility and investments or services provided by the customer. Id.
- It should allow for the determination and allocation of costs and benefits associated with the project over and above the costs and benefits of standard services provided by the utility. CUB/EDF Ex. 2.0 at 11-12.
- It should provide flexibility in options for customers to pay for any costs they incur, and provide an avenue for independent review of cost determination and allocation. CUB/EDF Ex. 2.0 at 12.
- It should direct that microgrid services be planned in coordination with other incentives, regulations, and services, including, but not limited to, any smart inverter services approved by the Commission. Id.

In response, ComEd agreed that if the Commission were to approve both Phases I and II, ComEd will work in good faith with CUB/EDF to discuss and develop a pilot microgrid services tariff and file such pilot tariff for Commission review and approval by no later than January 1, 2020. CUB/EDF Cross Ex. 1. Elements of the tariff would include that, in accordance with existing law:

- Microgrids may be developed and operated by parties other than a utility and non-utility parties may also manage or own generation assets that are integrated with such a microgrid.
- Customers may request ComEd to conduct a feasibility study of a proposed microgrid serving requesting customers, including the estimation of any incremental cost of services and facilities.
- Services that are provided by the utility under such a pilot tariff may include, but are not limited to, those supported by utility equipment and facilities enabling islanding and by the utility's microgrid controller. This would not foreclose service offerings that ComEd may lawfully make available to customers, or prevent customers from exercising their rights under law to take delivery service from ComEd or to purchase energy from qualified third parties.

Id., *see also* CUB/EDF Ex. 2.0. CUB/EDF note that it is anticipated that the pilot tariff would include provisions for cost recovery, and in line with the goals of enabling third party microgrids, ComEd would consult with stakeholders concerning the terms of the pilot before submitting the tariff. CUB/EDF Cross Ex. 1.

With this agreement, CUB and EDF's concerns regarding Commission approval of both Phase I and Phase II of the Project as currently proposed by ComEd have been resolved. ComEd Cross Ex. 1.0.

D. Commission Analysis and Conclusion

The Commission approves the reports described by ComEd, specifically the Annual Report, special report pertaining to certain procurement outcomes, as described in Section III, Phase I report, cost/benefit report, and final report. The Commission agrees with ComEd and Staff that a report after Phase I completion on whether the MMC functioned satisfactorily is appropriate. The Commission agrees with Staff that any findings on tariffs are premature in this docket. The Commission assumes that ComEd will make a separate tariff filing related to this docket if and when warranted.

VIII. FINDINGS AND ORDERING PARAGRAPHS

The Commission, having given due consideration to the entire record and being fully advised in the premises, is of the opinion and finds that:

(1) Commonwealth Edison Company is an Illinois corporation engaged in the transmission, distribution, and sale of electricity to the public in Illinois and is a public utility as defined in Section 3-105 of the Public Utilities Act;

(2) the Commission has jurisdiction over the parties and the subject matter herein;

(3) the recitals of fact and conclusions of law reached in the prefatory portion of this Order are supported by the evidence of record and are hereby adopted as findings of fact and conclusions of law;

(4) it is prudent and reasonable for Commonwealth Edison Company to proceed with the Bronzeville Microgrid Demonstration Project;

(5) the Project serves distribution purposes, and therefore, the operating and capital investment costs associated with the Project are distribution costs that are properly included in distribution accounts;

(6) Staff's proposed accounting, accepted by Commonwealth Edison Company, for the Bronzeville Microgrid Demonstration Project is appropriate;

(7) the prudent and reasonable costs of the Project are delivery services costs subject to examination in future EIMA formula rate proceedings, and recoverable through Commonwealth Edison Company's delivery formula rates, and the costs of capital investments related to the Project are properly recovered over their useful lives for depreciation purposes;

(8) the costs of the Bronzeville Microgrid Demonstration Project should be recovered from all delivery services customers under the rate design then in effect; and

(9) the Project will not change the volume of Commonwealth Edison Company's retail energy sales, will not impair customers' rights to select a qualified RES, and will not impair or increase the cost of providing competitive energy supply.

IT IS THEREFORE ORDERED by the Illinois Commerce Commission that Commonwealth Edison Company's Bronzeville Microgrid Demonstration Project is approved.

IT IS FURTHER ORDERED that Commonwealth Edison Company and Staff will submit a Staff Report that includes proposals on how to integrate higher levels of renewable DERs, due no later than 120 days after the Final Order.

IT IS FURTHER ORDERED that Commonwealth Edison Company will conduct procurement workshops as directed by this Order.

IT IS FURTHER ORDERED that in the event that Commonwealth Edison Company receives no bids, no reasonable bids, or a bid such that ComEd is concerned that accepting the bid would alter the cost structure for the Project or call into question its prudence for non-storage Project DER, Commonwealth Edison Company will file as a

compliance filing in this docket a report specifically describing the results of the procurement, in confidential and public versions if necessary.

IT IS FURTHER ORDERED that Commonwealth Edison Company will report the results of its Project metrics to the Commission and stakeholders by filing an Initial Metrics/Cost Benefit Report in 2020.

IT IS FURTHER ORDERED that Commonwealth Edison Company will submit Annual Reports each year on the anniversary of the commission's approval of the Project for the duration of the ten year study period, as directed in this Order.

IT IS FURTHER ORDERED that Commonwealth Edison Company will file a Phase I Report, either consisting of the report submitted by Commonwealth Edison Company to the Department of Energy or a separate report describing the development, operation, and learnings from Phase I, after the completion of Phase I.

IT IS FURTHER ORDERED that Commonwealth Edison Company will submit a certification before proceeding to Phase II that: (i) the MMC operates satisfactorily and within design parameters, as determined through "power hardware in the loop" testing, which creates and simulates the feeder topology in Bronzeville; (ii) the Project at that point meets the minimum qualifications for receipt of funding under the SHINES grant; and (iii) includes a report on an applicable limited set of metrics.

IT IS FURTHER ORDERED that Commonwealth Edison Company will file a comprehensive Final Report at the end of the study period, as adjusted in consultation with the Illinois Commerce Commission and stakeholders, describing the development, operation and learnings from the full Project.

IT IS FURTHER ORDERED that any motions, petitions, objections, and other matters in this proceeding which remain outstanding are hereby disposed of consistent with the conclusions herein.

IT IS FURTHER ORDERED that, subject to the provisions of Section 10-113 of the Public Utilities Act and 83 Ill. Adm. Code 200.880, this Order is final; it is not subject to the Administrative Review Law.

By Order of the Commission this 28th day of February, 2018.

(SIGNED) BRIEN SHEAHAN

Chairman